

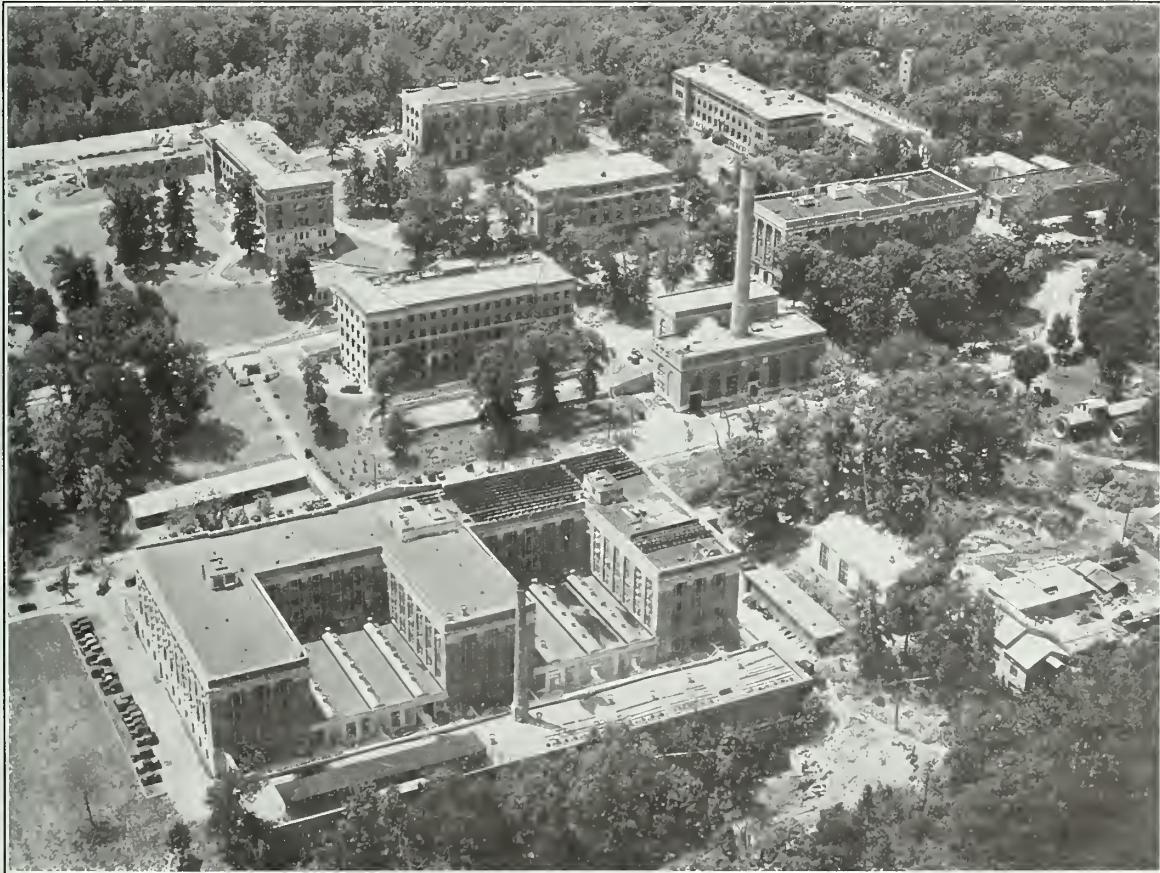
Bureau of Standards

AUG 27 1932

COMMERCIAL STANDARDS MONTHLY



A Review of Progress in
Commercial Standardization and Simplification



Photographed by Army Air Corps

AIRPLANE VIEW OF BUREAU OF STANDARDS (LOOKING SOUTH)

ISSUED BY THE BUREAU OF STANDARDS OF THE UNITED
STATES DEPARTMENT OF COMMERCE, WASHINGTON, D. C., U. S. A.

Vol. 9, No. 2



AUGUST, 1932

The Commercial Standardization Group

A. S. Mc ALLISTER, Assistant Director

DIVISION OF SIMPLIFIED PRACTICE

Edwin W. Ely

The division of simplified practice cooperates with industrial and commercial groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified practice recommendation. Such work includes surveys of current practice, formulation of a simplified practice program, and presentation of that program for action by a general conference representing all interests. The division then transmits to all concerned a full report of the general conference, with a request for written acceptance of the action taken. When the volume of acceptances is sufficient to indicate initial success, the Department of Commerce endorses the program and publishes the recommendation. The division thereafter cooperates with a standing committee appointed by the industry concerned, in conducting periodic surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision. Simplified practice may be applied to any commodity or activity in which it will reduce waste. The division stands ready to render service in developing and making effective any application of simplified practice which will reduce waste, stabilize business, or extend commerce.

BUILDING AND HOUSING DIVISION

J. S. Taylor

The division of building and housing, formed in 1921, cooperates with business, technical, and professional groups in furthering construction activities. It works to modernize building codes and to encourage improved standards for the quality of building construction, and the practical application of the latest development in design and use of building materials.

It encourages home ownership through the development of an enlarged, steadier, more intelligent, and more discriminating demand for dwellings—the largest single class of buildings which the construction industries provide.

The division also cooperates with other governmental agencies and with many private business and professional groups in efforts to distribute building activity more evenly throughout the year and to secure less fluctuation from year to year.

The work on city planning and zoning has the broad objective of making buildings more useful through proper location with respect to other structures, stabilizing of land values and property uses, well coordinated thoroughfare systems, and well laid out public works.

DIVISION OF SPECIFICATIONS

A. S. McAllister

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. It ascertains the standardization and specifications promoting activities of the associations and societies, and brings to their attention the work being done by the commercial standardization group. It brings the Federal specifications and commercial standards to the attention of the maximum number of producers and users of commodities complying with these standards and specifications. It compiles and distributes lists of sources of supply of materials guaranteed to comply with the standards and specifications. It shows both buyers and sellers the benefits from handling nationally specified, certified, and labeled commodities. The division prepares directories of governmental and nongovernmental testing laboratories and the Directory of Specifications, and is working on an encyclopedia of specifications, the first two volumes of which have been issued, namely, "Standards and Specifications in the Wood-Using Industries" and "Standards and Specifications for Non-metallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

STANDARDIZATION
...IS..
A CONTINUING PROCESS
~~~  
ITS AIM IS NOT FIXITY  
OR STAGNATION  
..BUT..  
TO ADD SERVICEABILITY  
AS OFTEN AS THE  
POTENTIAL GAIN  
MAKES IT WORTH WHILE

### DIVISION OF TRADE STANDARDS

I. J. Fairchild

The division of trade standards, on request, assists industrial and commercial groups in the voluntary establishment of standards covering grades, quality, dimensional inter-changeability, or other acceptance criteria as a national basis for marketing manufactured commodities.

The detail criteria are selected or determined voluntarily by interested buyers or sellers, without any Government dictation or domination, and adjusted at a general conference of producers, distributors, and users so as to represent the composite views of all branches. The division functions chiefly as a neutral agency to see that all interested elements are given full opportunity to be heard and satisfied; to solicit and record acceptances; and to publish and promulgate the standard when a satisfactory majority of acceptances is obtained and provided there is no active opposition.

Industries are encouraged to apply self-certifying labels to products meeting the commercial standard requirements, as a means of protecting the consumer and the scrupulous seller from misrepresentation or unfair methods of marketing.

Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

# COMMERCIAL STANDARDS MONTHLY

*A Review of Progress in  
Commercial Standardization and Simplification*

VOLUME 9

WASHINGTON, D. C., AUGUST, 1932

NUMBER 2

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### AN INVITATION TO VISIT THE BUREAU OF STANDARDS

A cordial invitation is extended to all interested in scientific progress to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basic contributions to radio, aviation, and other modern arts and industries.

## National Hydraulic Laboratory Building Completed

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THE NEW hydraulic laboratory building of the Bureau of Standards, the erection of which was advanced to promote employment in the building trade, was turned over to the Government by the contractor on March 12, 1932. Since that time the members of the laboratory staff have been occupied with the design and installation of the equipment which is necessary to the carrying out of experimental work.

Five centrifugal pumps having a total capacity of about 60,000 gallons per minute have been purchased and installed. At the present time, work is progressing on the installation of the piping for these pumps, of constant level tanks, sluice gates, and a 5-ton hoist. A considerable amount of instrumental equipment for operating the laboratory and for use in hydraulic investigations is on order.

Economy in the use of water was made a feature of the design of this laboratory. Instead of drawing water from the city's mains, passing it through the experimental equipment, and then wasting it, two large storage basins which will contain a total of about 1,250,000 gallons of water have been provided as sources of supply for the experiments. The water will be pumped from these storage basins to special supply tanks on the various floors, will then be passed through the experimental equipment, and finally returned to the storage basins to be used again. It is estimated that the entire water supply will be circulated many hundreds of times before it will be so contaminated that fresh water must be supplied. (A detailed article on "The National Hydraulic Laboratory," by H. N. Eaton, of the Bureau of Standards staff, appeared in the June, 1930, issue of COMMERCIAL STANDARDS MONTHLY.)

The first scientific investigation to be conducted in the new laboratory relates to the friction losses resulting from the flow of water around pipe bends. The Bureau of Reclamation of the United States Department of the Interior has requested that the Bureau of Standards undertake an investigation of this subject, since these bend losses are of real economic importance in the design of large lines for carrying irrigation water. Members of the hydraulic laboratory staff are already preparing plans for the experimental work, and it is anticipated that the first actual experiments can be commenced in September of this year.

## OBSERVATIONS ON THE STANDARDIZATION OF TEXTILES

By L. R. GILBERT, *Bureau of Standards*

In view of the recent widespread interest in the standardization of textiles and textile products, augmented by news and trade paper comment, it is believed that a brief outline of the present status of a few projects in this field may be of value.

Some of the standards of major importance are those for Cotton Cloth for Rubber and Pyroxylin Coating, the Regain of Mercerized Cotton Yarns, Men's Shirts (Exclusive of Work Shirts), Wool and Part Wool Blankets, Cotton Fabric Tents, Tarpaulins and Covers, and Hosiery Lengths. Only three of these will be discussed.

*Hosiery Lengths.*—Within two weeks after the general conference on hosiery lengths a sufficient number of acceptances had been received to justify announcing the indorsement of the industry, but criticisms of the lengths of children's hose were of sufficient importance to justify placing the matter before the standing committee for revision. This work is now being done and the committee's recommendations are expected to be circulated to the industry at an early date.

It is believed this standard will be of value to the industry if it carries the information the trade wants and, therefore, every possible effort is being made to have it embrace such data before it is established as a commercial standard.

*Men's shirts (exclusive of work shirts).*—Various manufacturers of higher class shirts have for some time used preshrunk fabrics in the manufacture of these garments, making it possible to produce a shirt with a minimum amount of shrinkage. However, until now we have had no national standard as a basis for correct sizes and shrinkage and the user has bought shirts half to a full size larger than that actually needed to make sure that he can button the collar band after the shirt has been laundered.

Most of us think that if a shirting fabric has been preshrunk the shirt will retain its original size without shrinking. Experience has disproved this notion, but the misunderstanding is yet so prevalent that the National Association of Shirt Manufacturers thought it necessary to send the following statement to shirting fabric converters. "If a shirting fabric shrinks 2 per cent, a shirt made from this fabric may shrink more than 2 per cent. Thus in order to be sure that the finished garment complies with the standard worked out by this association, the shirt manufacturer using preshrunk goods must insist that the shrinkage tolerance of the material shall be sufficiently below the 2 per cent tolerance permitted in the garment measurements, to allow for thread and laundry shrinkage, although proper laundering is specified."

It may be of interest to know that within the last three or four years, processes for accurately shrinking a fabric within known limits have been developed, making shrunken cloth available for use in the manufacture of almost any grade of shirt.

*Wool and part wool blankets.*—For many years the system of labeling part-wool blankets has been misleading; the consumer who bought a blanket marked "part wool" had no idea how much or how little wool he was getting. In fact, if he had been given authentic

information he would have been astounded that any manufacturer had the audacity to mention the word "wool" in connection with a blanket carrying so small a proportion of wool. According to the National Retail Dry Goods Association more than 75 per cent of the blankets labeled "part wool" contain less than 10 per cent of wool and a large percentage less than 1 per cent.

There is a general consensus on the part of wool manufacturers and retailers that wool content less than 25 per cent in a blanket adds very little to its value. In reality no one has yet determined just what amount of wool is needed to make a better blanket or whether it is possible to make a blanket of cotton or some other fiber that throughout its life will be as warm as a wool or part-wool blanket.

There is, however, a demand for a low priced part-wool blanket and the industry feels that while 5 per cent wool adds very little to the value of a blanket, it will satisfactorily meet that demand and be a decided improvement over the present system of describing blankets as "part wool." For that reason the following requirement was inserted in the recommended commercial standard for wool and part-wool blankets: "No finished blanket containing less than 5 per cent wool shall carry the word 'wool' in any form."

Another part of this specification has been so generally misunderstood that it may be of interest to explain rather fully the item: "Blankets labeled with the word 'wool' in any form and containing: Between 5 and 25 per cent wool shall be labeled 'part wool; not less than 5 per cent wool'."

There are those who think that blankets containing 10, 15, or 20 per cent wool will be marked "5 per cent wool" and deem it unfair to the purchaser as well as to the manufacturer to have to label a blanket "5 per cent wool" when it carries a wool content of 10 per cent or even more.

In this connection it is important to bear in mind the following points. First, it is claimed that blankets containing between 10 and 25 per cent wool are not now being manufactured and that they have not been manufactured for a number of years. Second, it is not to be expected that a manufacturer would put appreciably more than 5 per cent wool in a blanket which he marks "part wool; not less than 5 per cent wool." In no instance is this likely to be done and if a salesman should say that there is considerably more wool than the minimum indicated by the ticket or label, he will, in all probability, be misrepresenting the facts. Third, the label which the buyer sees on the 5 per cent part wool blanket will carry no other figure than the 5 per cent, leaving no excuse whatever for misunderstanding by the buyer.

The parts of the specification which state that blankets labeled with the word "wool" in any form and containing more than 25 per cent wool shall be labeled with the guaranteed (minimum) wool content in percentage, and those carrying above 98 per cent wool shall be labeled "all wool," are clear, understandable, and apparently satisfactory to the industry and need no further comment.

*Contacts.*—This paper would be incomplete if it did not mention the sponsors of our projects, who are emblematic of the high type of work being done. The men and women who compose the conferences are usually representative of the best in the industry and as a rule know the details of their business fully and completely. They know what they want, they are

fairly certain what the industry needs and are not to be sidetracked or deflected from writing a specification that will best meet all the requirements of the trade. To these men and women industry owes a debt of gratitude for the work they have done and are doing toward the establishment of commercial standards.

## GAGING MACHINERY PARTS FOR INTERCHANGEABILITY

Research and Tests by Bureau of Standards as Aid in Standardization of Tools Used in Manufacturing

By H. W. BEARCE, *Bureau of Standards*

The Bureau of Standards conducts gage work in connection with machine tools and cooperates in the standardization and tests of gages, being made by science and industry. It also undertakes research in connection with this work.

In the early days of machine tools little attention was given to interchangeability of parts, either of the machines themselves or of the products of the machines. Each part of each machine and each part produced by the machine was largely an individual product. Usually when such a part was required to assemble and function with one or more other parts a certain amount of hand fitting was expected and required.

Under such a system the initial assembly of parts, and the replacement of broken or worn-out parts were expensive and time consuming.

Under our modern system of mass production complete interchangeability of parts is the end sought, and the vast majority of cases attained.

Under this system all parts that are intended to be alike are, in fact, so nearly alike in their important dimensions that any part taken at random from a large number of similar parts will assemble and function as intended, when mated with other parts similarly taken at random from a large number without hand-fitting or other additional work.

That, in brief, is the basic principle of interchangeable manufacture. The successful application of this principle requires the use of production and inspection methods and equipment that are such as to insure that the important dimensions of each part will be within proper limits.

The test of parts to determine whether or not they are within specified dimensional limits is usually carried out by means of limit gages.

Limit gages are made in a wide variety of designs, for an equally wide variety of purposes, but for the inspection of plain cylindrical shafts and holes, and for ordinary screw threads, such as are found on bolts,

nuts, and screws, the most commonly used gages may be classified as "go" and "not go" plain and thread plug, ring, and snap gages.

The proper use of correct "go" gages insures assembly of accepted parts; that is, no entering members that are too large, and no receiving members that are too small, will be accepted by correct "go" gages. "Go" gages have no control over the opposite aspect of the fit of mating parts; that is, they do not insure that the mating parts will not be too loose. This must be controlled by the use of "not go" gages. "Not go" gages insure that no entering members that are too small, and no receiving members that are too large, are accepted.

The successful use of any system of gaging requires, of course, that the gages themselves be kept within the prescribed limits for the parts. If the gages are allowed to be outside the prescribed limits, either initially, or as the result of wear, parts will be accepted which are outside the limits, and

the whole gaging system may fail of its purpose.

"Go" gages wear in the direction to produce interference and nonassembly. Working "go" gages must, therefore, be watched with extreme care and must be constantly checked against other gages that are known to be accurate, or must be measured at sufficiently frequent intervals to insure that they are maintained within the prescribed limits.

"Not go" gages wear in the direction of the "go" gage limits, and in the direction of safety, since the purpose of "not go" gages is to guard against excessive looseness. The effect of wear of "not go" gages is, therefore, to reduce the amount of tolerance available to the manufacturer, and to reject parts that are not outside the prescribed limits, and that should not, therefore, be rejected.

Interchangeable manufacture, and its control by gaging, is a subject so broad and yet so exacting in detail that only a few of its many aspects can be touched upon in a paper of this character.

## NATIONAL CONFERENCE ON WEIGHTS AND MEASURES POSTPONED

The Twenty-fifth National Conference on Weights and Measures was to have been held in Washington early in June. However, in the interest of conservation of public funds, it was deemed advisable to postpone the conference till next year, and a proposal to this effect by the officers was approved by an almost unanimous vote of the executive committee.

Consequently, there will be no conference during the calendar year 1932.

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## AMERICAN STANDARDS ASSOCIATION

### Association Presents Review of Its Work for the Month of July

The following current information concerning developments in standardization projects under the auspices and procedures of the American Standards Association has been furnished by that association:

*Mechanical refrigeration.*—The American Society of Refrigerating Engineers has submitted a revision of the safety code for mechanical refrigeration. The revision was made in order to bring within the code two new refrigerants which have come into use since the original code was approved. These refrigerants are methyl formate and dichlorodifluoromethane.

*Lighting of school buildings.*—The Illuminating Engineering Society and the American Institute of Architects as sponsors for the code on lighting of school buildings, have submitted a revised draft of this code for approval as American standard. The code, which was unanimously approved by the technical committee after about 18 months' work, has been referred to the safety code correlating committee for approval.

*Sanitation code.*—Copies of the tentative draft of the industrial sanitation code now being considered by the sectional committee are available for criticism and comment. The code, which is being developed under the sponsorship of the United States Public Health Service, includes rules for industrial establishments, mines, and labor camps, on water supply, ventilation, housekeeping, waste disposal, inspection, toilet and washing facilities, retiring and dressing rooms, lunch rooms, etc. Copies of the draft code may be obtained from the A. S. A., 29 West Thirty-ninth Street, New York, N. Y.

*Nonshatterable glass.*—The initiation of a project by the A. S. A. on methods of test and performance requirements of nonshatterable glass has been requested by the National Bureau of Casualty and Surety Underwriters. Many State motor vehicle commissions and highway departments are requiring the installation of nonshatterable glass in various classes of motor vehicles and the State of Massachusetts has developed a group of tests which nonshatterable glass used in cars registered in that State must be subjected to. The request has been referred to the safety code correlating committee for recommendation to standards council.

*Emergency lighting.*—The National Electrical Manufacturers Association has requested the A. S. A. to initiate a project on emergency lighting. The N. E. M. A. points out that many State and municipal regulatory bodies have developed regulations requiring the installation of emergency lighting systems principally in places of public assembly and that the many conflicting requirements appearing in these regulations makes it exceedingly difficult for manufacturers to develop a product which is acceptable to the various regulatory groups. The request has been referred to the safety code correlating committee and the electrical standards committee for joint recommendation to standards council.

*Punch and die sets.*—A proposed American tentative standard on punch and die sets has been published for general criticism and comment. The draft gives

the most important dimensions of five types of punch and die sets, as follows: Regular series; reverse series; long series; round, back-post series; and round, diagonal-post series. It also gives dimensions of guide posts, guide post bushings, steel punch shanks, bolts, clamps, and washers for the several sets, and specifies the material of which the different component parts should be made.

*Screen testing of ores.*—Methods for screen testing of ores (hand method) has been approved by A. S. A. as American recommended practice with the designation of M5—1932. In approving this standard, attention is called to the work of the sectional committee on sieves, which may ultimately affect some of the provisions of the new standard, and approval does not prejudice any future recommendations from the sectional committee on sieves. The new standard has been developed by the milling committee of the A. I. M. E. For some years investigations of crushing phenomena emphasized the necessity for standard methods of gaging particle size and led to the preparation of this method of laboratory practice, which has particular application to technical studies where close control is essential. In draft form the standard has had wide circulation in the mining industry since 1930.

*Drawings and drafting room practice.*—A proposed American recommended practice for graphical symbols to be used on drawings has been published for criticism and comment. It covers 44 symbols for plumbing fixtures, 17 symbols for conventional rivet layouts, 21 symbols for heat-power apparatus, 32 symbols for electric power apparatus, 27 symbols for pipe and pipe fittings, and 23 symbols for heating and ventilating layouts. The symbols for plumbing fixtures were originally proposed by the National Association of Master Plumbers of the United States, and have been reviewed by the structural-service committee of the American Institute of Architects. The symbols for conventional rivet layouts were developed by the subcommittee on line work. Symbols on heat-power apparatus were taken over from the advisory committee on steam turbines of the International Electro-Technical Commission, and are indorsed by the A. S. M. E. committee on power test codes. The symbols for electric power apparatus form part of the recommendations formulated by sectional committee on scientific and engineering symbols and abbreviations. The symbols for pipe and pipe fittings, and for heating and ventilating layouts were taken over from the American Society of Heating and Ventilating Engineers, and partly from the German national standards in this field.

*Clean coal.*—Although all organizations that had been invited to appoint representatives had not made definite designations, the organization meeting of the recently approved sectional committee to develop specifications for clean bituminous coal was held in Pittsburgh at the headquarters of the Engineers Society of Western Pennsylvania on June 29. At this meeting, attended by 17 representatives of 16 organizations, several of whom were also acting as observers

for other groups, the project before the committee was discussed at length. After careful consideration of the scope of the project, the committee voted to limit its work for the present to bituminous coal 2 inches (circular) and over in size, in accordance with the following scope:

Specifications outlining allowable limits of unacceptable material in prepared bituminous coal, whether mechanically cleaned or not, in sizes 2 inches and above; the purpose being to define clean coal and not to standardize screen sizes.

However, the possibility of an extension of the scope to sizes smaller than 2 inches was considered and it was decided that the executive committee should study

the difficulties that might be encountered and the advantages that might accrue from such an extension. Discussion of the determination of unacceptable foreign material in bituminous coal brought out the fact that there are no standard methods available. Differences in technique of the float-and-sink test (the test that is most widely used) are not serious, but do require harmonizing. It was decided to appoint a subcommittee on methods of sampling and testing. The cooperation of the American Society for Testing Materials and the United States Bureau of Mines is to be enlisted to bring about unification of these methods into accepted national standards.

## FACTORY-FILLED ICE CREAM PACKAGES

### Industry Has Adopted Simplified Schedule of Sizes for Capacities and Shapes of Cups, Which Is Expected to Improve Marketing of Ice Cream

The economical and sanitary distribution of ice cream has in recent years attracted the attention of the ice cream manufacturers, and to-day, according to the opinion of leaders in the industry, the next important step forward will be the increased use of factory-filled packages in which the ice cream will have approximately the same consistency, flavor, and taste as the bulk products retailed in the store-packed container. It is said that the increased use of factory-filled packages will help to solve the shrinkage problem and yield the retailer a more certain profit. Moreover, the use of factory-filled packages is in line with the trend of modern merchandising methods and the preference of the buying public. A properly made factory-filled package provides a uniform quantity in a convenient, sanitary, and economical form.

In line with the trend toward factory-filled packages and in view of the successful work done in standardizing ice cream cans, molds, and cartons the simplified practice committee of the International Association of Ice Cream Manufacturers some time ago considered that the next logical step in their simplification program was to take up the study of ice cream cups. Upon investigation, it was discovered that there were numerous capacities and shapes of cups being used in the industry. The committee concluded that some of the shapes and capacities could be eliminated with economy and profit to the trade.

Several meetings were held by the committee which were attended by representatives of the cup manufacturers. The final report of the committee was presented at the convention of the International Association of Ice Cream Manufacturers in Cleveland, October 25, 1930, and was unanimously approved. Following the approval of its report, the committee submitted a tentative recommendation to the division of simplified practice of the Bureau of Standards with the request that arrangements be made for a general conference of all interests to formulate a definite simplified practice recommendation. Such a conference was held on December 10, 1930, and in accordance with action taken, five sizes of cups were recommended for adoption as standard stock items on the basis of capacity. These sizes are  $\frac{1}{6}$  pint,  $\frac{1}{4}$  pint,  $\frac{1}{2}$  pint, 1 pint, and 1 quart. Standard cap diameters were also recommended for all except the

$\frac{1}{6}$ -pint cup, and certain shapes were designated for the standard cups.

The action of the conference resulted in a reduction from 4 capacities of the so-called 5-cent cup to 1 capacity, viz, the  $\frac{1}{6}$  pint, or 48 cups to the gallon. The capacities of the so-called 10-cent size are reduced from 5 to 1, viz, the  $\frac{1}{4}$ -pint size, and the caps for this size cup are reduced from 3 diameters to 1. The shapes of the half-pint cup are reduced from 3 to 1, and the cap diameters are reduced from 5 to 2. For the 1-pint cup, the shapes are reduced from 2 to 1 and the cap diameters are reduced from 5 to 2. The diameters of caps for the quart cup are reduced from 2 to 1.

This simplification program, which has been accepted by the industry, became effective January 1, 1932, for new production. A further period of eight months from that date, which will be September 1, 1932, is provided for the disposal of existing stocks of eliminated varieties in shapes and sizes of cups and caps. The recommendation is subject to annual revision by a standing committee which has been organized to represent the ice-cream producers, the cup makers, and the builders of cup-filling and capping machines.

It is confidently expected by leaders in the industry that the general adoption of this program will clear the way to the development of universal or standard cup-filling and capping machines with a consequent reduction of investment in these machines. Further economies as a result of higher speed and more accurate filling of cups are anticipated with improvement in the texture of ice cream, due to quick handling from freezer to hardening room.

## BOYS' BLOUSES, BUTTON-ON WAISTS, SHIRTS, AND JUNIOR SHIRTS

Upon consideration of the adherence report on the commercial standard for boys' blouses, button-on waists, shirts, and junior shirts, the standing committee has recommended the reaffirmation of the standard without change for another year or until authorized revision is duly indorsed by the industry and announcement has been issued to this effect.

Manufacture of boys' blouses, button-on waists, shirts, and junior shirts conforming to the requirements of the Commercial Standard CS14-31 was shown to be 70 per cent of the production of those reporting.

## FIRE-RESISTANCE RESEARCH BY BUREAU OF STANDARDS

### Recent Tests of Materials by Bureau of Standards of Interest to the Building Official

By S. H. INGBERG, *Bureau of Standards*

The actuating condition that prompts research along fire resistance lines is a high fire loss that for the United States has approximated \$500,000,000 per year in property alone. To this must be added the cost of insurance exclusive of the losses paid, the cost of fire protection and loss in protection and employment due to fire, which items taken together with the property loss give a total economic loss in excess of \$1,000,000,000 per year. Our per capita loss is high as compared to the European loss, even after allowance has been made for the difference in wealth per capita. In life loss from fire the Census Bureau statistics give a loss of between 6,000 and 8,000 lives annually, exclusive of those from industrial burns and scalds.

Fire-severity tests comprise a study of the fire itself in point of the severity in temperature and duration that can obtain with given amounts and character of combustible building contents. While the severity of a fire condition would appear, at first sight, to be too indefinite for quantitative evaluation, the problem can be simplified considerably by assuming only the conditions that produce the higher range of severity. On this basis, we have obtained values in terms of periods of exposure to the standard furnace test, for occupancies comprising ordinary combustible materials ranging in weight from light office or residential occupancies at 10 pounds per square foot of floor area, to the heavier record storage occupancies with more than 50 pounds per square foot of floor area.

Tests to determine the hazard of a building to its surroundings are difficult to arrange so that the results may have quantitative value. In some tests with sheet metal steel-framed garages we were able to determine with a fair degree of certainty the hazard to frame walls spaced at different distances from the garage which was burned out with contents of automobiles and other materials that might be present in such buildings. Some information on the hazard to the surroundings from brick-walled joisted buildings was obtained in a test with a 2-story and 5-story adjacent buildings of the warehouse type that were burned out with combustible contents in the different portions ranging from  $7\frac{1}{2}$  to 30 pounds per square foot of floor area. This test also gave pertinent information on the exposure conditions in such buildings particularly as concerns the severity of fire and impact to record containers, such as insulated safes.

Some of our first work along the line of fire tests of materials and construction was concerned with the standardization of the fire testing procedure from the standpoint of furnace severity, method of measuring furnace temperature and the criteria of failure of the construction being tested.

Our list of publications contains references to tests completed and published on structural steel, cast iron, reinforced concrete, and timber columns, tested unprotected and protected with materials in several thicknesses. We have also conducted recently tests of columns protected by poured gypsum and precast

gypsum block. Tests have further been completed of load-bearing hollow tile walls, solid and hollow brick walls, and of proscenium curtains.

A series of fire tests of interior wood and metal stud partitions is now in progress. Fire tests of a new type of welded steel floor construction are being conducted in cooperation with the American Institute of Steel Construction.

The methods of conducting fire tests of materials as distinguished from tests of the construction into which they enter are not well standardized and possibly the need for uniform procedure is not as urgent as for the tests of assemblies.

A considerable portion of the work with materials consists in determining their properties as affected by the temperatures and conditions to which they may be exposed in building fires. Tests to determine the compressive strength and elastic properties of structural steel and cast iron at temperatures up to  $1,000^{\circ}\text{C}$ . have been completed, and the results in part published.

Fire endurance and fire and impact tests of insulated safes have been conducted to determine conformity with Federal specifications, and a number of tests have been conducted to develop performance bases for inclusion in specification requirements. Tests have also been made of fire extinguishers, fire hose, automatic fire detecting equipment and automatic sprinklers. It has been found generally that performance requirements in specifications are more satisfactory to both purchaser and manufacturer than detail design requirements, as this widens the field of purchase and leaves the designer more freedom in the choice of materials and details. The formulation of effective requirements demands a close study of the particular conditions to which the equipment is subjected, supplemented by adequate tests to determine performance under such conditions.

Some work has been done on the classification of the fire loss by causes, seasons, and occupancy. Experimental studies have been made of the conditions under which fires are caused by such agents as discarded cigarettes, cigars, and matches, and some improvements in their make-up suggested that would decrease the hazard. Tests to determine the susceptibility of fibrous materials to spontaneous heating have been recently completed, the work having been done in part in cooperation with a group of the marine underwriters.

The hazard of photographic, X-ray, and motion-picture film has been given consideration, and suggested safety requirements formulated. A series of tests has been completed on the protections required for household heating and cooking appliances to prevent ignition of adjacent combustible walls, ceilings, and floors.

The units in the Government service that are concerned with fire resistance research and fire prevention have, during the past year, assisted in the organization work of the Federal Fire Council. This consists of representatives from Government departments and

establishments, and functions in advisory and informative capacity on matters relating to fire prevention and protection arising in connection with Government activities. Included in its scope are the formulation of recommended standards or policies relating to such items as exit requirements for buildings, protection of records, elimination of fire hazards, fire protection

equipment, and fire alarm and patrol service, unless already covered by interdepartmental agencies. Inspections have been made and reports rendered on a number of institutions and Government buildings in the District of Columbia and arrangements made for inspections of institutions elsewhere by other agencies.

## RESEARCH AIDS COMPANY IN DRAFTING STANDARDS

### International Silver Co. Maintains Laboratories for Testing Materials

By M. R. STERNBERG, *International Silver Co.*

The International Silver Co. has saved considerable money in making use of the research facilities of its Factory X, or scientific research laboratory located in Meriden, Conn., where metallurgical, chemical, and physical investigations are carried on. One of the most important aspects of these activities is the assistance rendered in developing standard specifications used in the manufacture of our products. Approved lists of suppliers of all standard materials are made up on the basis of tests by the research department, and it is from these lists that inquiries are made.

Whenever a new supplier comes into a field or when an old one makes improvements, the materials are tested by the laboratory and, if satisfactory, the names of such concerns are added to the list. This, naturally, prevents favoritism, places the making of purchases on a proper basis, and insures a progressive and liberal attitude toward all those who may furnish the various materials needed. It encourages them to undertake developments by which this company may profit in order that they, in turn, may profit by securing its business.

Our suppliers know that if they have anything new which we can use to advantage, it will be thoroughly tested and tried out by the laboratory staff. The suppliers' technical men are given every opportunity to set forth and develop their ideas in cooperation with our laboratory so that there can be no possibility of their feeling that they are not given the most serious consideration.

An aspect of backing up purchases by research which has proved to be a great benefit has been with respect to materials entering into the manufacture of silver tissues, wrapping papers, paper boxes, display chests, glues, and lining materials which are first tested by the laboratory for our various suppliers, to see that all materials pass our sulphide tests before they are accepted. For instance, in one of our cutlery plants complaint was made by the factory that the steel developed a rough surface which was first thought to be the fault of the steel. The matter was investigated by the laboratory and supplier jointly and it was found that the trouble was due to improper fuel combustion during the forging operation.

In the instance under consideration the purchasing department was exonerated from providing improper material; something had gone amiss in the production processes. Furthermore, the supplier was also exonerated. The best of relations are maintained with our suppliers. They know that they will not be unjustly accused, and if a complaint does come through to

them there is a good reason for it. Knowing this in advance, they take the greatest care that nothing but materials strictly up to the specifications are shipped to us. Naturally this saves a great deal of money to all concerned.

It is good management to develop and make use of standards of all kinds based on research. Some of them are set by the manufacturers, others can only be determined by the laboratory because they involve chemical or physical research, or both.

Another very intimate relation between the purchasing department and research laboratory is in connection with the purchase of die steels for making dies. As may be realized, the making of silverware involves the stamping or ornamentation of base metal in a series of operations in which steel dies are used. The use of the proper steel and its correct heat treatment is of the greatest importance for while the cost of steel itself does not amount to so much, the cost of highly skilled labor expended on it in making the dies is high. Consequently every reasonable precaution must be taken to produce dies with the best possible lasting qualities. These qualities depend mainly on the character of the steel and its heat treatment. For this reason all purchases of die steels are carried in the laboratory warehouse where every piece is tested to make sure that it is right before any work is done on it.

In other words, the laboratory has absolute and immediate control of the acceptance of all this class of steel. Further, the laboratory also does the heating of the finished dies. As a result of all this, a great deal of money has been saved.

All new products are referred to the laboratory for approval when of a metallurgical or chemical nature. Anything pertaining to mechanical or electrical production improvements and plant maintenance is sent to the engineering department for investigation.

New ideas often originate with the purchasing department because we are continually being approached by salesmen, and any matters which seem worthwhile to investigate are referred to the laboratory for investigation.

Research, it will be seen, is made use of by us for setting standards, preparing standard specifications and determining what suppliers are worthy of being placed on the approved list, and for the testing of raw materials used in the various processes to make sure that they come up to specification requirements before they are accepted.

## ELIMINATION OF WASTE IN IRON AND STEEL

### Bureau of Standards Has Aided Industry in Research, Simplified Practice, and Standardization

The research, standardizing, and other committees of the various national technical societies form very convenient and direct means for the Bureau of Standards to cooperate with the technical and operating aspects of the industry. By such means research projects far too extensive for any one organization to handle can be undertaken. Through its representatives on eight of the committees of the American Society for Testing Materials dealing with ferrous materials, the bureau is cooperating on a number of widely variant subjects representing different aspects of the iron and steel industry. A representative example is the extensive series of exposure tests in various parts of the country to determine the relative behavior of various compositions of sheet steels and zinc-coated steel products—sheet, wire, and hardware—when exposed to the weather.

Through several of the research committees of the American Society of Mechanical Engineers such subjects as the cutting of metals, the welding of pressure vessels, and mechanical springs have been studied. Help has been given to the cast-iron and steel foundry industry through the American Foundrymen's Association in a number of ways. In particular, methods have been developed for the testing of foundry sands, thereby putting the specification and purchase of these materials on a rational basis. The old rule-of-thumb foundry methods for the routine "control" of sands in the foundry are being replaced by an accurate and reproducible method of sand control based largely upon the tests developed. Through a special joint committee representing different national technical organizations and interested Government departments, under the chairmanship of the Director of the Bureau of Standards, the general subject of the permissible limits of phosphorus and sulphur in steel is being studied on a large scale. These two elements are the ones which are most widely contested in specifications relating to the composition of steels.

A joint research committee sponsored by the American Society for Testing Materials and the American Society of Mechanical Engineers for the study of the properties of materials intended for services involving high temperatures, such as oil-cracking stills, steam superheaters and the like, constitutes an excellent means for cooperating with the interested parties in this recently developed field of steel metallurgy.

Other typical examples of cooperative work of this kind in progress are the study of quenching media for hardening steel with the American Society for Steel Treating, the zinc coating of iron and steel carried out through a sectional committee organized by the American Standards Association, and the cutting or machining of steels in cooperation with the American Society of Mechanical Engineers.

By a plan inaugurated a few years ago technical and trade organizations are permitted to place a research worker at the bureau and to utilize its facilities in the investigation of problems of mutual interest to the industry represented and to the bureau. In this way problems of immediate interest to the indus-

try receive consideration without any great delay. Recent studies made this way, on which reports are now available, relate to difficulties encountered in the steel-casting industry. Likewise, in cooperation with the American Foundrymen's Association, the shrinkage of cast iron in the molds has been investigated. Another line of investigation just completed has a bearing on stabilization of austenitic steels now widely used industrially for high-temperature service.

An extensive investigation of the serviceability when subjected to weather of sheet metal protected in a variety of ways by electroplated coatings is in progress in cooperation with the American Electroplaters Society and the American Society for Testing Materials. More than 7,000 sheet-metal specimens are being plated in different ways and are being exposed to the weather in a number of locations representative of widely different atmospheric conditions, such as an industrial atmosphere, a marine atmosphere, and others. Another problem relating to the causes of soil corrosion is being investigated for the Cast Iron Research Association under the research-associate plan.

Through the Federal Specifications Board, of which the Director of the Bureau of Standards is ex-officio chairman, the bureau cooperates actively in the preparation of specifications for use in Government purchases. These specifications, whenever possible, are adjusted to meet current industrial practices. Twenty-five such specifications covering ferrous metals have been promulgated, together with two-thirds as many more on metal products, such as wire rope, fencing, chain, etc., and pipe, pipe fittings, and related products. Several others are on the way.

In compliance with the recommendations of an advisory board organized as the result of a conference of representatives of State governors called by the Secretary of Commerce in 1923, there has been prepared by the division of specifications of the Bureau of Standards, a directory of all known nationally recognized commodity specifications, in which iron and steel occupies a prominent place. To supplement the directory an encyclopedia of specifications is being prepared. The third volume now nearing completion, deals with "Standards and Specifications for Metals and Metal Products." Iron and steel naturally constitute a large part of this.

As a result of consultation with all organized American producers, distributors, and consumers the certification plan has been applied by the division of specifications to certain Federal specifications. Steel and iron products covered include builders' hardware, padlocks, pipe and pipe fittings, wire pipe, burglar-resisting safes, metal laths, railroad track scales, weighing scales, and metallic tubing. In this application of the certification plan to Federal iron and steel specifications, effective assistance has been received from various trade associations. A typical example is that of the Associated Metal Lath Manufacturers. Officers of that association recommended to its members that the certification plan be applied to

Federal specification No. 553 for metal lath. On March 17, 1931, the association voted in favor of this. The significance of this action will be appreciated when it is known that this association and others had shown some hesitancy in this standardization work because of the supposed possibility of opposition by the Federal Trade Commission. Recent statements from this commission, however, have completely clarified the situation.

The certification plan has also been applied to several commercial standards for certain iron and steel products, namely, steel pipe nipples, wrought-iron pipe nipples, standard-weight malleable iron or steel screwed unions, plain and thread plug and ring gage blanks, builders' template hardware, diamond core drill fittings, and builders' nontemplate hardware.

On request from industry, the Bureau of Standards assists industrial and commercial groups in the establishment of simplified-practice recommendations and commercial standards. The division of simplified practice of the bureau cooperates with such groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified-practice recommendation.

The iron and steel industry was one of the first to avail itself of the facilities offered by the division of simplified practice. Metal lath was the first product of this industry to be considered, and it was followed in rapid succession by a large number of projects covering products which represented all phases of the iron, steel, and hardware trade. To-day almost half of the recommendations which have been passed through the procedure of the division cover items produced by this industry. The effects and benefits of simplification have been felt by the hardware and construction industries to a greater extent than the other branches in the field of iron and steel. In the construction industry alone simplified practice recommendations have been promulgated covering the following:

Metal lath, range boilers and expansion tanks, builders' hardware, hot-water storage tanks, steel reinforcing bars, sheet steel, eaves trough and conductor pipe, roofing ternes, cut tacks and small cut nails, steel reinforcing spirals, wrought-iron and wrought-steel pipe, turnbuckles, solid section steel windows, iron and steel roofing, hollow metal doors, kalamein doors, forms for concrete ribbed floor construction, open-web steel joints, metal partitions for toilets and showers, and wheelbarrows.

For the hardware and mill supply trade simplified practice recommendations have been promulgated covering files and rasps, woven-wire fencing, forged tools, steel barrels and drums, plow bolts, milling cutters, shovels, spades, and scoops, packaging of carriage, machine and lag bolts, metallic cartridges, flashlight cases, hack-saw blades, bell-bottom screw jacks, pocket knives, and welded chain.

Projects covering the following commodities have also been completed: Steel lockers, tinware, galvanized and japanned ware, classification of iron and steel scrap, roller bearings, hospital plumbing fixtures (enameled iron), and dental hypodermic needles.

In addition to all of these completed projects which directly cover iron and steel products, numerous simplification programs, covering commodities which are used in the production and physical distribution of steel products, have been accepted and adopted by the iron and steel industry. In other words, simplification projects have been completed which affect the iron and steel industry as a representative consumer of commodities. This is important for the reason that all simplified practice recommendations are designed to benefit alike manufacturers, distributors, and users of commodities. In this group of consumer goods may be listed abrasive materials, foundry refractory materials, invoice forms, to mention a few. A complete list of active simplified practice recommendations is available, as are the individual printed books. Also, there is available a complete description of the method followed by industries in preparing simplified practice recommendations.

Thus far only completed simplification programs have been mentioned. There are other projects in this field which are still in the formative and development stages. One of the most important of these—one which will affect not only the manufacturers of iron and steel building materials, but also other elements of the construction industry—is that concerning masonry opening sizes. This project, initiated by the manufacturers of steel windows, has for its objective the establishment of masonry opening sizes based upon a constant variation in width and height of opening. In this question consideration of all masonry materials is necessary, if proper coordination of sizes and dimensions is to be achieved.

The division of trade standards of the Bureau of Standards assists industry to proceed from consideration of sizes and varieties to the establishment of commercial standards covering grades, quality, and other acceptable criteria to serve as a national basis for marketing manufactured commodities. Several such standards for iron and steel products have been adopted by industry.

Manufacturers representing more than 90 per cent of production cooperated in the establishment of a commercial standard for builders' hardware (nontemplate). It has been said that buildings are no better than their hardware, which in simple terms means that doors, windows, and transoms may not be expected to operate satisfactorily for any length of time unless the hinges, locks, sash pulleys, transom lifters, and other items are selected of suitable size, type, and construction to function properly. This commercial standard includes more than 150 general items of builders' hardware. The major requirements of design, construction, and finish are covered for hardware made of such material as cast and wrought iron, steel and bronze in natural finish or plated with nickel, silver, gold, or chromium. The standard became effective June 1, 1930.

To assist building contractors and manufacturers of hollow metal doors in obtaining earlier delivery of builders' template hardware, as well as complete interchangeability and ready replacement of these parts, regardless of sources of manufacture, a commercial standard for this commodity has been established.

A commercial standard of direct interest to the foundry industry relates to foundry patterns of wood.

Color markings have been used for many years on foundry patterns to clarify, for the molder, the exact intention of the patternmaker with regard to the various parts of the pattern and the core box. In 1926 a standard color code for marking of foundry patterns was adopted by the American Foundrymen's Association in cooperation with a number of other national

organizations. Later the cooperation of the Bureau of Standards was requested in establishing the system of color marking as a commercial standard. This commercial standard is now effective. More than 450 firms and associations have indicated, in writing, that the color system recommended will be made a part of their regular practice.

## STANDARDIZATION OF BLADES FOR TRUCK ROAD SCRAPERS

Joint Committee of Road Officials Working to Standardize Size and Thickness of Blades

By B. C. TINEY<sup>1</sup>

The truck scraper, a device to be attached underneath a motor truck and used in the scraping of gravel, chert, and similar types of road surfaces, has been developed during the past 10 years in the State of Michigan, and its use has spread to adjoining States. The blade is applied to the road surface by hydraulic or pneumatic pressure supplemented by springs.

This piece of equipment, being destined by its efficiency to a very wide use, it was evident that considerable benefit would accrue to both users and manufacturers, by standardizing the size and thickness of blades, the spacing of the holes for attaching the blades, and by formulating a tentative standard specification for blade material. A joint committee of the American Road Builders' Association and American Association of State Highway Officials was accordingly formed in July, 1931, for this purpose.

Prior to 1931 it had been the practice of manufacturers of this equipment to attach the cutting blades directly to the hanger arms of the scraper, without moldboards. The varying positions of these arms on different scrapers and trucks rendered necessary the use of a moldboard in order to standardize the punchings in the blades. The standardization as recommended by this joint committee has been based on work done by the State Highway Department of Michigan, but subject to considerable revision and extension.

The standard flat blade, as adopted, is three-eighths inch thick and 10 inches wide. For moldboards of 8 feet or less in length the blade is in a single section, but for 10 and 12 foot moldboards the standard provides for two half-length sections of blades to facilitate shipment and handling. Two horizontal rows of holes are provided at spacings, from each end of the blade, of 3 inches, and then in intervals of 1 foot each. This corresponds to the horizontal spacing previously adopted by the above organizations for rigid-blade graders. The holes are punched oval shaped to allow a slight tolerance in attaching the blade to the moldboard, and also to avoid the distortion of the metal, which is liable to occur with square punching.

The moldboard has a rectangular cross section of 8½ inches. It also has two horizontal rows of holes which

correspond in spacing to those in the blade. This standard contemplates the vertical shifting of the flat blade on the moldboard three times during the life of the blade. In the first position the bolts are placed through the bottom row of holes in the blade and the top row of holes in the moldboard. This will cause the blade to project 3 inches below the bottom of the moldboard, and when this portion is worn away the bolts are removed and placed through the top row of holes in the blade and the top row of holes in the moldboard, or through the bottom row of holes in the blade and the bottom row of holes in the moldboard. The third position will be with the bolts through the top row of holes in the blade and the bottom row of holes in the moldboard. With this system of blade mounting, about 75 per cent of the blade will be used before discarding.

At four points in the moldboard a single slot opening is substituted for the vertical pair of holes. This is for the purpose of facilitating shifting of the blade to different positions on the moldboard, inasmuch as all bolts, other than at the slotted holes, are entirely removed, and the bolts in the slotted holes simply loosened sufficiently to allow the blade to slide to the next position.

While the flat blade is most universally used on this type of scraper, there has been a more limited use of the curved type of blade where it was desired to do heavier cutting of the road surface than could be accomplished with the flat blade. The committee has therefore recommended in addition to the flat blades, a curved blade for occasional use, which may be attached to the flat moldboard. The standard curved blade has but one horizontal row of holes, and is not intended to be shifted to different vertical positions on the moldboard.

A standard has also been provided with a 7-inch height moldboard and a 9-inch blade, for use on smaller trucks which might not have sufficient clearance for installations of the regular standard 8-inch moldboard.

The committee has assembled information from various highway organizations and blade manufacturers relative to the specifications for steel used in grader blades. A study of this information is being made, but no definite conclusions, which might form the basis of recommendations, have been reached to date. It is anticipated that further work will be done on this phase of the investigation during 1932.

<sup>1</sup> Maintenance engineer, Michigan State highway department, serving as chairman, joint committee of American Road Builders' Association and American Association of State Highway Officials on standardization of blades for truck scrapers.

## REVISED S. A. E. PROCEDURE

### Society of Automotive Engineers Approves 13 Reports and Changes Its Administrative Procedure

At the first meeting of the standards committee of the Society of Automotive Engineers, held recently in accordance with the new regulations governing the committee, 13 of 15 reports submitted by 7 divisions of the society were approved. The action taken was as follows:

The report of the aircraft division was a change from recommended practice to S. A. E. standard of aircraft instrument cases and mountings. No change was made in the substance of the specifications. The ball and roller bearings division submitted six reports, four of which were approved. When the S. A. E. standard for ball bearings was last reviewed and generally revised, conversion to millimeters from inches was based on the factor 25.4 rather than the more exact factor 25.40005. World-wide agreement on 25.4 as the factor for industrial and commercial, but not for scientific or accurate, conversions is in process of accomplishment, and this report was submitted as an indication of agreement by the automotive industry upon this factor for ordinary use.

It is understood that virtually all countries, including Great Britain, are in agreement, and concurrence of American national practice is expected very soon, through the American Standards Association, of which the S. A. E. is a member body. For convenience, the factor 0.03937 for similar conversions to inches from millimeters was also approved for ordinary work. The largest diameter in the present standard for ball bearings is 580 mm, and this factor gives a difference of only 0.000045 inch, compared with the accurate factor of 0.039370079.

The reports on annular single-row bearings, separable or open-type bearings and the angular contact-type bearings were submitted for approval of these bearings for American Standard under procedure of the A. S. A. They have been S. A. E. standard for several years. The reports on steering-knuckle thrust bearings and ball-bearing lock-nut washers were referred again to the ball and roller bearings division for further consideration, because of objections and differences of dimensions that were submitted just prior to the meeting of the standards committee.

The gasoline-engine division submitted two reports, the first on two sizes of gasoline-engine mounting pads that are now in common use. An intermediate size

has been submitted since the division completed its original report and will be referred to the division for inclusion later. The other report is a standard of dimensions for piston rings and grooves for both cast-iron and aluminum pistons in diameters from 2 to 8 inches, inclusive.

The report of the lubricants division on a classification for free-wheeling lubricants is the culmination of a year of earnest work by the automotive engineers and oil companies. The classification was approved

for publication and trial as general information for the remainder of this year, with the understanding that the division will consider further whether to continue it as recommended practice in its present or some revised form before it is republished in the next issue of the S. A. E. Handbook. The classification will be published in an early issue of the S. A. E. Journal.

All of the standards for nonferrous metal specifications now published in the S. A. E. Handbook are being reviewed by the non-

ferrous metals division for revisions and additions and coordination with corresponding specifications of the American Society for Testing Materials. The report as approved includes five new specifications for aluminum-base die-casting alloys, and two specifications for zinc-base die-casting alloys. General information notes on the zinc-base alloys are included, and similar notes are being prepared for the aluminum-base alloys.

The parts and fittings division recommended revision of the present S. A. E. recommended practice for ball studs to bring it up to date, and the cancellation of the S. A. E. recommended practices for lubricator cups and carburetor throttle levers, both of which have become obsolete and for which the division feels no standard is needed in the S. A. E. Handbook.

The production division reported a specification for rotating air cylinders and adapters, which is a part of the tool-standardization program of the sectional committee on standardization of small tools and machine-tool elements, for which the S. A. E. is co-sponsor with the American Society of Mechanical Engineers and the National Machine Tool Builders Association, under the procedure of the American Standards Association. The report was approved for American standard but not for publication as an S. A. E. standard.

The Society of Automotive Engineers has approved the revised standards committee regulations. The major change from the old procedure is elimination of the general standards committee session at annual and semianual meetings, expediting decisions by both divisions and the standards committee, and making it possible for the standards committee and council finally to approve the adoption of reports at any time during the year. Only changes in the nature of correction of errors or editorial modifications are permitted under the new regulations, thus requiring that reports be either adopted as recommended by the divisions or modified by the standards committee with the approval of the divisions submitting the reports. The reporting of standards to a general business session of the S. A. E. has been discontinued, as it had become merely a routine step in the procedure and had no value in the formulating and adopting of standards.

## INDUSTRIAL RESEARCH AS FOSTERED BY TRADE ASSOCIATIONS

By WILLIAM SPRARAGEN<sup>1</sup>

Present-day competition is between different industries as distinguished from the old competition which was only among the several firms of the same industry.

In the old competition each individual company of a given industry sought to maintain a portion or secure a greater percentage of that industry's business. Probably research, as much as anything else, has made it possible for a totally different industry to compete successfully for part or even all of the business of some other industry.

When research is mentioned as a possible trade association activity one of the first questions asked is: Does not research properly belong to the province of individual companies of an association rather than to the association itself? The answer is apparent. Some types of problems should be conducted by the individual companies and others by the association.

In general, those problems which are common to a number of companies should be carried out by the association. This eliminates unnecessary duplication, reduces the cost of the investigational work to any one company, and moreover by combining the experience and knowledge of a number tends to increase the chances of a successful solution. There are also other problems which, because of their fundamental nature, are too expensive to be undertaken by any one company. These and others involving studies over a period of years, or dealing with matters of public relations or welfare, should be conducted by the association. Others which relate to patentable discoveries, special processes and items of a similar nature can be best carried out by the individual companies.

Universities and governmental departments often possess superior equipment and personnel. These institutions are more favorably disposed toward co-operative research with an industry rather than with an individual company. An argument not usually advanced for such cooperative research is the creation of good fellowship among competing companies.

The selection of a research committee in an association is an exceedingly important matter. The committee itself must be composed, not only of technical men, but also of executives; moreover, it should represent the interests of the small company as well as the large, and also the "user" viewpoint. The actual selection of the men should be based upon their mental attitude toward research. In several investigations with which the author is familiar considerable loss of funds, time, and effort has resulted from the selection of a so-called "practical" research committee which insisted that the investigations be carried out to stimulate service conditions which oftentimes involved a number of variables beyond the control of the investigator. In research work involving public relations there is an advantage in cooperative research, since the trade association or technical society usually can speak with authority for its industry. This simplifies contact with the industry in determining policies and reaching decisions.

The selection of any program for study should be pursued with care. Some problems will be found to be of such a nature that they will yield results in a reasonably short time and thus provide against the possibility of condemnation by more impatient members of an association. The program should include, if possible, problems of a fundamental as well as a practical nature. Before a project is undertaken certain yardsticks should be applied in the nature of the following questions:

1. Is the project really important?
2. What are the prospects of success?
3. Has it been done before?
4. Are the resources of time, money, and personnel available for successful completion?

It is desirable to lay out a suitable program of research with proper recognition of the time element involved for a probable solution of each problem. Some problems require for their complete solution a period of years and, unless careful financial provisions are made for completing the work undertaken, considerable sums of money may be wasted, since the preparatory work can seldom be translated into profitable use.

Some problems should be of such a nature that usable results may be obtained after a period of one year, others perhaps after a period of two years, and still others after three or more years. In this way continued confidence would result in the work of an association and particularly on the part of some of the more impatient members.

An association desiring to undertake research as part of its activities should make a thorough survey of the most important chronic technical problems hindering the progress of the industry as evidenced by the opinions of some of the key men of the industry and these should be given due consideration from the point of view of importance and of time element involved in their solution.

One of the great difficulties in conducting a research program, arises from the temptation of everyone, with trouble of any kind, to bring it to the laboratory for solution, thus turning the laboratory into a "trouble-shooting" agency rather than a research organization. Of course some of the problems undertaken by the research laboratory may properly arise as a result of troubles, but it is undesirable for the entire program to be given over to manufacturing problems rather than actual research work. Some trade associations have two separate departments to take care of these two types of problems.

A number of associations, such as the baking industry, the canning and the meat industry, maintain their own research laboratories. This presupposes a large initial outlay. Others avail themselves of the splendid facilities of Mellon Institute, Battelle Memorial Institute, and the many excellent commercial consulting laboratories. Still others maintain fellowships or make other suitable arrangements with colleges or universities. A large number utilize the facilities of various governmental departments such as the

<sup>1</sup> Secretary division of engineering and industrial research, National Research Council.

Bureau of Standards. The solution to be resorted to in any given case depends upon the circumstances. Highly complex scientific or technical problems require trained scientists and often special laboratory equipment and apparatus. Some mechanical processing problems, on the other hand, required facilities of shops and manufacturing plants under the guidance of trained observers.

There is need for patience in matters of research. This is particularly true where an industry or a company seeks to establish a new research laboratory. The gathering together of suitable personnel and apparatus, and the establishment of proper facilities and contacts would occupy nearly the full time of the director for a period of a year or more. Unfortunately, by that time some of the executives who are not familiar with research and its methods might have decided that the laboratory was a failure. Caution is necessary in the establishment of a new laboratory. In most instances it might be better to establish a fellowship or utilize the services of some existing laboratory in the manner indicated above. This reduces not only the cost of the initial outlay, but also hastens the time of productive results by taking advantage of existing facilities. Sometimes it may be found advisable to establish such arrangements in two different places on the same problem.

The work of the personnel that makes the best showing after a given time is then continued and expanded; the other is curtailed or abandoned. After a time, as the research activities of a company or association grow, it may be found advisable to transplant these activities, including the trained personnel, under more direct control and in a private laboratory.

Bringing about the utilization of the results of research by the smaller companies is particularly diffi-

cult. Cooperative research conducted by a trade association has certain advantages in the presentation of the results of the researches before technical meetings, in papers and reports of committees, thus bringing about a greater recognition of their value.

The question most commonly asked by an organization proposing to initiate a research program is: How much money should be spent and how should it be raised? Obviously the amount necessary and the means for obtaining it vary widely with each industry and even with different types of work in the same industry. The full return from an investment is, however, not to be obtained unless a complete solution is reached. Some organizations finance their research program by specific contributions for individual projects, others by special assessment by member companies, and still others by setting aside a special proportion of membership dues for this work. A few are fortunate in having research endowments.

The amounts spent annually for research range from a few hundred dollars to more than \$100,000. Some of the associations spending more than \$100,000 are: The National Canners' Association, the National Lime Association, and the Portland Cement Association.

Regardless of the method of financing, sufficient funds should be provided to carry a particular investigation to completion, assuming, of course, that preliminary results indicate the desirability of the investigation.

Finally, the importance of the continuity of the work can not be overstressed. Research conducted spasmodically when conditions permit or when necessity arises is not nearly as effective as well-laid-out programs of research carried on throughout a period of years.

## MEASURING SOUND ABSORPTION

The rate at which a sound dies out in a room, or its rate of decay, is most important in measuring the sound absorption of materials designed to correct acoustical defects in auditoriums, theaters, or other places of assembly or entertainment. Four different electrical recording methods for measuring the rate of decay of sound in a room have been used at the Bureau of Standards during the past several years. The latest of these methods is almost entirely automatic in operation, thus eliminating the human element which has been associated with reverberation measurements in the past. This method works through a large range of sound intensity. Observations are made at definite intervals and the rate of decay is accurately known through the whole range.

The July issue of the Bureau of Standards Journal of Research describes a special relay device which uses a pentode tube as an oscillator. The oscillator acts as a "trigger" circuit to stop an electrical timer as the sound decays to a definite level. An apparatus consisting of three relays and series of cams driven by an electric motor with a high reduction gear provides an automatic control for the reverberation meter. This will also be procurable in a separate print, known as Bureau of Standards Research Paper No. 457.

## BUILDERS' HARDWARE (NONTEMPLATE)

Reaffirmation of the commercial standard entitled "Builders Hardware (Nontemplate) CS22—30" was announced to manufacturers, distributors, and users of builders' hardware on June 21. This action was taken on the recommendation of the standing committee after considering an adherence survey report covering the 6-month period ending December 31, 1931. Such surveys are conducted periodically with the cooperation of manufacturers to determine the need for revising the standard to bring it into line with current developments in the industry.

This commercial standard covers certain general rules and practices, together with a list of finishes recommended by the industry as standard for domestic use. Brief descriptions of a number of sizes and types of hardware which are generally accepted as standard are also included.

This standard was originally issued as Simplified Practice Recommendation No. 18, which became effective January 1, 1925. A revision of this recommendation was issued in 1927, becoming effective on May 1 of that year. Upon a third revision three years later, at which time the recommendations were expanded, it was issued as Commercial Standard CS22—30, becoming effective for new production on June 1, 1930.

## ADVANTAGES AND DISADVANTAGES OF STANDARDIZATION

**State Purchasing Agents Review the Many Advantages That Result from Standardization as Against the Disadvantages**

By GEORGE H. HAINES<sup>1</sup>

The advantages of standardization are so obvious that to even think of disadvantages seems but mockery. However, there are in our midst persons who look upon the purchasing agent as just another official, and those who never seek the advice of the one trained in buying. There is another class who feel that the purchasing agent has been appointed to act as a "rubber stamp." Why are remarks of this nature injected into the subject of standardization? Purchases made by superintendents of institutions and heads of departments to satisfy some particular whim are the underlying factor in ruining the advantages of standardization.

Some few years ago, when the writer was placed in a position where conditions could only be described as chaotic, he was forced, through many hours of disappointments and discouraging labor in his efforts, to promote the standardization which he knew would substitute a settled mode of procedure for a condition of chaos. Perseverance alone, with standardization as the paramount thought, has produced the desired system and promoted the economic status of the taxpayer's dollar. To set up a system clear to all for whom such principles must be outlined is by no means an easy task. If selfish motives were cast aside and intelligent business minds acted to the advantages of standardization, further frugal harmony would replace the unpleasant and unsympathetic reaction of those who encroach upon the activities and duties which belong to the purchasing function.

Standardization's advantages can be realized in full only when the principles are strictly adhered to. Standardization does not apply to the actual buying alone, even though the material things so purchased are more conspicuous to the laymen by their substantial nature, their ability of being handled and compared for quality, size, workmanship, and all the other characteristics, which make this sort of standardization relatively simple. Standardization must also be practiced by the individual in his habits, his attitude toward his fellow workers, his personality, and the other characteristics which stamp him as a man, a square shooter, and in whom explicit confidence can be placed.

The advantages of standardization can be extended from the individual to the physical plant, the office, the warehouse, or stockrooms. The advantage of standardization in this direction not alone promotes efficiency, but also insures loyalty on the part of those entrusted to the many phases of the activity. Standardization of the treatment to all employees alike reflects itself in the quality of their performance; the service rendered is unstinted and generous, the price paid pays dividends. Standardization finds

everything in its allotted space. Standardization finds records where one expects to find them. Even the janitor may catch the fever; the floors, the hallways, the platform bespeaking standardization in his method. The advantages of standardization become apparent in the accounting office through which thousands of requisitions pass, thousands of invoices are vouchered, recorded and approved, thousands of additions and deductions made from the stock ledgers, thousands of orders written, checked, and issued, all adequately indexed for instant reference. No one will deny the advantages of standardization in the accounting office when the annual audit reveals absolute accuracy.

Standardization may show its advantages in many more respects, such as the standardization of specification forms, the standardization of intelligent bid proposal and quotation forms, standardized methods in handling the bundles of mail, parcel post, express and freight matter, and routed and distributed to eliminate any possible confusion.

The advantages of standardization in the writer's opinion are undisputed. Only those men or women who have made a study of conditions as they actually exist in a purchasing department can readily appreciate these advantages. The subject matter can best be analyzed by scrutinizing the monthly and yearly reports, the adherence to budget allowances, the savings made through investigation and frugal decisions, all of which present a clear picture of the advantages of standardization.

The disadvantages of standardization can be expressed only when some part of the service for which standardization was created is antagonistic to ideas or principles which limit certain activity in the fields of purchasing. I can recall only minor infractions which tend to diminish the efficiency of standardization and its advantages.

At times I have felt that the minority would yield to the majority in its acceptance of articles which satisfy the desires and uses of the greater number. This is not always the case, however, and sometimes the inconsiderate demand that their will be appeased. Thus disadvantage is injected in standardization. To illustrate the point, allow me to present some examples by selecting a few of the smaller items stocked in our warehouse. Nine of our institutions have adopted an extra heavy hot-dip galvanized water pail in a 14-quart size. It is quite natural that a merchant or storehouse keeper stocks that which the majority of his customers call for. One institution demands a 16-quart pail of an equal weight and quality. This is where disadvantages affect standardization and it is disadvantageous not alone to standardization but also to the taxpayer, for obvious reasons.

The purchase of smaller quantities involves additional costs. The added cost applies not only to the purchase of the smaller quantities, but also to the

<sup>1</sup> Purchasing agent, State of Rhode Island, Howard, R. I.; abstract of paper delivered before the governmental purchasing group and committee session of the National Association of Purchasing Agents, Detroit, June 7, 1932.

additional paper transaction, separate orders, separate invoicing, separate recording, and the time of the purchasing agent and his clerks in making individual purchases, not mentioning the additional carting or express charges.

Disadvantages are also created by Utopian ideas of individuals who have received their education through the glaring ads in magazines, the embellishment of which has fixed in the mind of the reader that nothing else will do. Little do they realize that the labeled goods they are asking for are made from basic materials which are quite as efficient in effect if put to proper use. I know of an instance where it is necessary to pay 10 cents a pound for a preparation, which may be bought for 4 cents a pound if the user would accept expert advice. In using the words "expert advice," I do not especially refer to the purchasing agent's knowledge of the product, but with the purchasing agent's contact with research laboratories.

On several occasions a test was made of other items, and I might suggest soap in this example. One institution laundry head could not use the soap chip because it was not labeled "amber." Permission was received from the dealer to paste some "amber" labels on the barrel which the institution had returned as unsatisfactory. The same barrel was then reshipped to the offended institution and it was "just what was wanted" and never came back. Of course, the soap chip was a standard product, and it proved to be advantageous even after being condemned as a "standardized disadvantage."

The disadvantages of standard products are practically nil, and the advantages from close adherence to standardization are numerous. Many cases can be cited, similar to the example above, and I will vouch for the overwhelming balance in favor of advantages, which present themselves every minute of a busy day.

## A. S. T. M. SPECIFICATIONS FOR GRAY IRON CASTINGS REVISED

A long step forward for the gray iron branch of the foundry industry was accomplished at the thirty-fifth annual meeting of the American Society for Testing Materials when the committee presented proposed tentative specifications for gray iron castings. These specifications, which offer revisions and will supersede present A. S. T. M. standard specifications for gray iron castings and also those relating to so-called high-test cast iron, involve many new departures.

Seven classes of gray iron castings are listed and designated, running from 20,000 to 60,000 pounds per square inch tensile strength. Transverse tests are provided as optional and provide for three bars, 0.875, 1.2, and 2.0 inches in diameter, which are to be tested upon span lengths of 12, 18, and 24 inches, respectively. Proportionate requirements for minimum breaking loads at the center are provided, in accordance with the various classifications. Both tension and transverse bars are cast separately from the casting.

A table of correction factors for variation from these diameters is supplied. Various requirements as to workmanship, finish, inspection, and other factors are included and at the request of the buyer, the manufacturer is obligated to certify his product to conform to the requirements of the specifications. Chemical

content is subordinated to physical properties, except upon individual agreement.

On agreement between manufacturer and purchaser three diameters of transverse test bars are as follows:

| Test bar | Controlling section of castings | Nominal diameter of test bar as cast |        |
|----------|---------------------------------|--------------------------------------|--------|
|          |                                 | Inches                               | Inches |
| A        |                                 | 0.75                                 | 0.875  |
| B        |                                 | 0.75-1.10                            | 1.20   |
| C        |                                 | 1.11-2.00                            | 2.00   |

The committee also presented new tentative specifications for cast-iron culvert pipe divided into standard, heavy, and extra-heavy classifications.

New proposed tentative specifications were presented to cover castings for railway, motor vehicle, agricultural machinery, and general-purpose machinery uses. These offer two grades with tensile strength requirements of 50,000 and 53,000 pounds per square inch, respectively, and elongation of 10 and 18 per cent in 2 inches.

## ROADSIDE FARM-PRODUCE STANDS USE LABEL TO IDENTIFY QUALITY OF PRODUCTS

Following the example set by roadside stand operators in Massachusetts in 1931, owners of roadside stands in Maine, Rhode Island, and Connecticut will this season adopt the use of the New England roadside stand sign. This sign is leased to roadside stand operators by the State departments of agriculture on the condition that the stand comply with certain standards established by the commissioners of agriculture. It is part of the New England farm marketing program, sponsored by the New England council.

The regulations are practically uniform for all four States which have adopted the use of the sign. They include requirements as to cleanliness, appearance, location, and source of products. All products offered for sale must be grown on the owner's farm or be bought directly from near-by producers. At least two kinds of produce must bear the New England quality label, sponsored by the council, or one such product must constitute 25 per cent of the stand's sale.

In all four States where the sign has been adopted, the department of agriculture will inspect each registered stand periodically throughout the year for the purpose of giving the stand owner whatever assistance possible and to make certain that the established standards are complied with.

## FEDERAL SPECIFICATIONS

Eleven specifications were acted on by the Federal Specifications Board during the month of July. Of this number five proposed specifications and six revisions have been sent out for official comment and criticism. Copies of these specifications in mimeographed form and further information can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C.

*(Specifications proposed)*

| New designation | Specifications to be revised                 | Old F. S. B. No. |
|-----------------|----------------------------------------------|------------------|
| P-C-451.....    | Cloth, abrasive, aluminum oxide.....         | 387b.            |
| P-P-101.....    | Paper, abrasive, artificial, waterproof..... | 582.             |
| P-P-111.....    | Paper, flint.....                            | 385b.            |
| P-P-121.....    | Paper, garnet.....                           | 386a.            |
| P-P-126.....    | Paper, garnet, waterproof.....               | 583.             |
| KK-L-291.....   | Leather, upholstery.....                     | 183.             |

## A. S. T. M. CONFERENCE APPROVES 40 NEW STANDARDS AND 75 REVISIONS OF OLD STANDARDS

Much new work in developing specifications was reported at the thirty-fifth annual meeting of the American Society for Testing Materials, despite the unfavorable influence of economic conditions, which were reflected in a sharp decrease in attendance as compared with last year.

Research was stressed as the chief objective of the society in an address by the retiring president, F. O. Clements, director of research of the General Motors Corporation, Detroit, Mich. Doctor Clements asserted that the objective of the American Society for Testing Materials must be a continual search for new knowledge and pointed out that the society's extensive standardization work involves the danger of leading to mental standardization. "The antidote and remedy for such a danger," he said, "is a continual search for new knowledge, or research in the field of materials."

By approximate count the meeting approved some 40 new standards and 75 revisions of standards. They bring the total number of the society's specifications up to about 660.

A noteworthy change in procedure, tending to speed up the adoption of specifications, became operative during the past year through the action of the new committee on standards, which is empowered to promulgate new tentative standards without their being submitted to a meeting of the society. Through this committee 15 new tentative standards were issued during the year, in addition to four revisions of previously existing standards. The new specifications included a group of five covering welded-steel pipe, lock-bar pipe, and riveted-steel and wrought-iron pipe, a specification for masonry cement, and a bend test for ductility of metal.

Two important recommendations of the steel committee were adopted: A restriction of Bessemer steel to acid Bessemer, and new specifications for structural

medium steel and for rivets. The former change affects 15 specifications of the society and is stated to be due to the fact that basic Bessemer is not manufactured in this country, and that in any special case the purchaser may specify that basic Bessemer will be acceptable. The medium steel specification was drafted because of demands for higher-strength steel for heavy construction.

A specification for structural rivet steel also was adopted as tentative. Such material is to have a tensile strength of 52,000 to 62,000 pounds, yield point 28,000 or one-half the tensile strength, elongation in 8 inches, 1,500,000/tensile strength, and cold bend 180° flat on itself. Phosphorus limits are 0.06 acid and 0.04 basic, and sulphur 0.045. Reinforcing-bar specifications were modified tentatively by eliminating the clause that permitted machining test specimens taken from deformed bars and by defining in some detail the bend-test procedure. Further, with respect to rail-steel reinforcement bars, a clause was added to exclude specifically the manufacture of such bars from anything other than standard section T rail. Electric-fusion-welded steel pipe was divided by suitable changes in the specifications into two classes, for pipe under 30 inches in diameter and for pipe 30 inches and more.

On recommendation of the wrought iron committee, a specification for riveted steel and wrought-iron pipe promulgated during the past year was changed by requiring that rivets in wrought-iron pipe shall be of wrought iron. Such rivets for the present are to be of staybolt-grade bars.

A specification revising the 2-year-old specification for malleable-iron castings was presented, to provide for a grade of higher strength than heretofore recognized. The new grade is required to have a minimum tensile strength of 53,000 and a yield point of 35,000, with 18 per cent elongation in 2 inches.

The cement committee, as a result of the activities of the cement reference laboratory, whose inspectors have found that changes in tolerances in the dimensions of some testing equipment would be advisable and that the wording of the old specifications is ambiguous, presented a revision of the specification of standard methods of testing cement. A supplement to this specification, known as the manual of cement testing, was also revised so as to be more explicit and more detailed. Also, tentative specifications and tests for compressive strength of Portland cement mortars, first issued in 1916, was withdrawn, inasmuch as it has been found that the small-cylinder test specimens are too difficult to make. Studies are being made upon a cube as a test specimen, and the use of plastic mortar.

In the report of the committee on road and paving materials principal interest centered on discussion of the adoption of standard definitions for bitumen, asphalt, flux, tar, and pitch. The contention of those opposing the definitions were that pressure still residue might be sold as asphalt, tar, or pitch, and that the definitions were indefinite and not in accord with classical, colloquial, or technical English. The definitions were recommended for letter ballot by the society.

As an aid in sampling and analyzing timber preservatives, volume and specific gravity correction tables for creosote, creosote coal tar solution, and coal tar have been prepared by the Bureau of Standards, and were adopted as a tentative standard of the society.

[Aluminum alloy, bars, rods, shapes, and wire (aluminum-copper-manganese-manganese). Cloth, cotton, for baling purposes. Treads, safety. Tubing, copper, seamless (for general use with 1. I. S. flanged fittings). Tubing, copper, seamless (for use with soldered or flared fittings).]

## FIBER INSULATING BOARD

The recommended commercial standard for fiber insulating board as adopted by the general conference of manufacturers, distributors, and users of the product held in Chicago, Ill., on May 16, 1932, was circulated to the industry for written acceptance.

Mimeographed copies of this standard may be obtained gratis from the Division of Trade Standards, Bureau of Standards, Washington, D. C.

## CAST STONE

A preliminary conference of cast-stone manufacturers was held in Washington, D. C., on June 17 to formulate plans for the establishment of a commercial standard covering the colors and finishes for cast stone. The conference was held at the conclusion of a 3-day exhibit of cast-stone samples submitted by manufacturers from all sections of the country. Thirty manufacturers participated by furnishing 104 samples, approximately one-half of which were submitted by nonmembers of the Cast Stone Institute, the organization which is sponsoring the project. The samples were arranged into 14 groups, according to color and finish, the manufacturers identification marks having been removed from all samples prior to the exhibit.

Preliminary selections of first, second, and third choice of the proposed standard samples were made from each group by an advisory committee composed of private architects and representatives from the construction divisions of the several Federal departments. Final selection of the 14 proposed standard samples were made by a special committee of five members, the personnel of which is as follows:

F. Leo Smith, technical secretary of the structural service department of the American Institute of Architects.

A. J. Boase, regional structural engineer, Portland Cement Association.

Ernest A. Wiedeman, vice president, Economy Concrete Co. of Virginia (Inc.), and President of the Cast Stone Institute. John Tucker, jr., chief of the cement and concreting materials section of the Bureau of Standards.

G. W. Wray, of the division of trade standards, Bureau of Standards.

The wide variation of shade necessitated the selection of 3 gray and 3 buff samples with rubbed finish, and 2 gray and 2 buff samples with bush-hammered finish, as proposed standard samples.

The proposed standard samples are to be designated as follows:

| Designation | Color | Finish         |
|-------------|-------|----------------|
| SS-10A      | Gray  | Rubbed.        |
| SS-10B      | do    | Do.            |
| SS-10C      | do    | Do.            |
| SS-20A      | do    | Bush hammered. |
| SS-20B      | do    | Do.            |
| SS-30       | do    | Brushed.       |
| SS-40       | do    | Etched.        |
| SS-15A      | Buff  | Rubbed.        |
| SS-15B      | do    | Do.            |
| SS-15C      | do    | Do.            |
| SS-25A      | do    | Bush hammered. |
| SS-25B      | do    | Do.            |
| SS-35       | do    | Brushed.       |
| SS-45       | do    | Etched.        |

In accordance with the standardization program, small duplicates of the above proposed standard samples are to be made available to manufacturers through the Cast Stone Institute, and will probably be ready for distribution about September 1, 1932. Sets of samples are to be prepared by the institute and placed in the construction divisions of Federal, State, and municipal governments for guidance in the selection of the desired cast stone for specific jobs.

Present plans call for a small sample of the cast stone specified to be furnished to the successful general contractor and another to the building inspector for comparison with the material actually delivered.

It is not expected that any one manufacturer will be able to furnish cast stone to match all proposed standard samples. Each manufacturer is expected to work out his formulas for matching the standard samples using materials available to him. In this work the manufacturer is to be furnished with as much information as the Institute has available concerning source and size of aggregate, etc. A list of manufacturers throughout the country will be prepared showing the standard colors and finishes that each manufacturer can furnish. This list will be distributed to Federal, State, and municipal construction divisions, architects and general contractors to inform them which of the standard cast stones are available in various sections of the country.

The proposed standard sample plan will be tried out for perhaps a year, and if it works successfully the project will be brought to a general conference of manufacturers, distributors, and users of cast stone. It is the belief of those sponsoring this enterprise that the standards of color and texture will facilitate the procurement of the desired material and clarify misunderstandings that have often occurred between the architect and the manufacturer of cast stone.

## BINDER'S BOARD SIMPLIFIED SCHEDULE REAFFIRMED

Several years ago the Binder's Board Manufacturers' Association requested the assistance of the Bureau of Standards in reducing the then existing diversity of sizes and thickness of binder's board. A factual survey made at that time revealed the fact that there were being produced a total of 718 different sizes of the product, and that each size was made in from 1 to 27 different thicknesses. The survey further indicated that 790 items were sold in lots of from 100 to 1,000 bundles each, and that only 193 items were in sufficient demand to run the individual totals over 1,000 bundles each.

In order to improve manufacturing and marketing conditions existing in the trade, a general conference of all interests met in 1928, under the auspices of the Bureau of Standards, and gave approval to a simplified schedule of 10 stock sizes of binders' board. This recommendation, designated as Simplified Practice Recommendation No. 81-28, became effective on March 1, 1928, subject to an annual review by representatives of the industry. These 10 stock sizes have satisfactorily met the needs of the trade so the standing committee of the industry has just informed the Bureau of Standards that the schedule has been reaffirmed, without change, for another year.

## PAPER CONES AND TUBES FOR TEXTILE WINDING

A general conference of manufacturers, distributors, and users recently held in New York, approved a simplified practice recommendation for paper cones and tubes used in the textile industry for winding purposes. This program, which was developed under the auspices of the Bureau of Standards, is the first of a series of similar programs for various textile machinery parts.

In reviewing the need for such simplification, E. F. Parks, general superintendent of the Universal Winding Co., stated that prior to the approval of the simplified schedule there were being manufactured 163 distinct types of spindles with 1,900 varying sizes. This caused an inflation of manufacturing costs and inventory. The new industries have no tabulations of standards to order equipment from and the older textile industries most frequently order their new machines equipped with spindles "same as last" or, "with spindles to fit bobbin or tube as per sample herewith."

The "same-as-last" customers might easily pick some standard spindle, if such were tabulated, that could be used equally well and the "sample herewith" is generally picked at random and usually only varies from what might have easily been standard had no error been made in its manufacture or had it been made to conform to some standard bobbin, quill, or tube.

"From our records," said Mr. Parks, "we have prepared our own lists and drawings of what we consider standard, particularly with reference to the hole size. These standards are called for on approximately 80 per cent of our orders and, on the remaining 20 per cent, they are special. On one machine alone, we have 30 standard style spindles with 200 different sizes, and in the special spindles we have 74 styles with 1,016 varied sizes."

The first meeting of manufacturers of various kinds of textile machinery to consider this proposal was held in June, 1929, in New York. Those attending the conference were unanimous in their belief that diversification in the industry as regards types, sizes, and varieties of wooden filling bobbins, quills, spools, spindles, and paper tubes and cones offered an unusual opportunity for simplification, and expressed their desire to cooperate in the effort to develop simplified practice recommendations for their respective companies. The companies were also unanimous in the belief that the details of a simplified practice recommendation for each part could best be handled by a committee of manufacturers making that item. Accordingly, committees were appointed to represent the following groups: Winding-machine manufacturers; carding and spinning machine manufacturers; loom manufacturers; bobbin, spool, and shuttle manufacturers; paper tube manufacturers; and worsted spinning mule manufacturers.

While no specific recommendations were made as to the scope of the initial program, it was suggested that consideration be given to hole sizes for spindles, reduction in variety of bobbins and quills of all kinds, and reduction in number of sizes of paper cones and tubes. The committee on paper cones and tubes was the first to formulate its proposals and, upon the re-

quest of its chairman, J. L. Coker, 3d., president, Sonoco Products Co., Hartsville, S. C., the general conference on June 29, 1932, was called.

The recommendation, as presented by the committee and approved by the conference, covers cones and parallel tubes made of paper. The schedule of sizes of cones includes over-all length, inside diameter at the base, taper, dry weight per 1,000, length of nose burnish, traverse, use, and color. Thirteen varieties in all are listed ranging in length from  $5\frac{7}{8}$  to  $10\frac{1}{2}$  inches, and in base diameter from 1.818 to 3.273 inches. These are used for warp and knitting yarns, silk, rayon, hosiery yarns, tire cords, etc. The schedule provides for nine varieties of parallel paper tubes ranging in length from  $2\frac{5}{8}$  inches to  $6\frac{1}{2}$  inches and in inside diameter from  $\frac{5}{8}$  to  $1\frac{1}{8}$  inches. The recommendation lists for these tubes include length, inside diameter, dry weight per 1,000, color and use. Some of the specified uses are light and heavy weight thread package, rayon yarn, shoe thread, wire insulating yarn, etc.

The actual reduction in variety, considering all factors, which will follow the adoption of this program is indeterminate. In the opinion of the chairman of the committee, J. L. Coker, gradual adoption of the recommended sizes in place of the many now used for the same or similar purposes will not only help to prevent increase in unnecessary variety but will work toward the gradual elimination of many sizes now in use. As the demand increases for the recommended sizes, the economies inherent in simplification will be realized.

## MANUAL ON PURCHASE AND USE OF LUMBER DISCUSSED BY LUMBERMEN

One of the most important developments of the 1932 convention of the National Lumber Manufacturers Association was the explanation of a proposed lumber purchase and use specification manual, which the association has had under way for a period of nearly five years.

This manual was described to the lumbermen as intended for the architect, engineer, and designer who specifies what the ultimate consumer should buy and use. It would deal with the classification and grading of lumber only sufficiently detailed to acquaint this class of buyer with some of the basic principles of grading lumber; the classes of lumber in which he is interested; the advantages of American lumber standards; the kinds, sizes, items and grades available.

Another section of the manual would show how to select lumber. Tables and charts would present technical data on properties of all species, and would include basic engineering information. More than 50 per cent of the manual would deal with specifying and using lumber. It would consist of definite recommendations as to species, and the grades in those species, for the bulk of the uses to which softwood yard lumber, structural materials and finishing lumber are put. It would enable the user to determine all the individual species suitable for the individual parts of building, highway bridges, docks, wharves, piers and other structures. Knowing suitable species, the user would then be able to determine the grade recommended in each species for the different classes of work and construction.

## PROTECTION THROUGH QUALITY IDENTIFICATION

There is always a market for quality. People in general like to know what they are getting for their money. Unconsciously they compare values with some standard set up in that particular commodity. They measure the value they receive in terms of the recognized value that they would secure from the standard. The trend in marketing is toward specification of quality. This trend is making itself felt in practically every line and is usually guaranteed through the medium of a self-identifying quality label.

Purchasers, inspectors, municipal authorities, and many others are interested in knowing whether or not devices and materials have been listed by Underwriters' Laboratories. There are many devices and materials to which the Underwriters' Laboratories label service form of inspection is not applied, but which are inspected under the laboratories' reexamination service. To determine whether or not such goods have been passed upon by the laboratories, it has hitherto been necessary to search through rather voluminous lists for the manufacturer's name and the article and to compare the catalogue number or other marking of the device with the description given.

In order to provide, for devices and materials under its reexamination service, a more positive, convenient, and immediately available means of determining whether or not a device or material is listed, the laboratories have now made available, for use under suitable regulation, a marker to be applied to such goods. This marker is a circular design bearing the words "Listed under reexamination service, Underwriters' Laboratories," which is to be attached to the goods or appears on the carton or other container in which the device or material is sold. It may appear in various color combinations under the regulations of the laboratories governing its use.

### POLISHED COTTON TWINE

Because of the many factors which enter into the production, distribution, and use of all kinds of twine, this commodity is susceptible to simplification. Experience with simplification programs for twine made of various hard fibers and of soft or jute fibers has shown that sound programs for these materials are not only well supported by the industry but result in the benefits which are expected to follow.

The Bureau of Standards has announced that the simplification program for polished cotton twine (R124) has received sufficient support to insure its initial success and that copies of the published recommendation may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents per copy. The general conference of the industry to consider this recommendation was held in New York on June 17, 1931. The essential information upon which the program was based was collected by a simplified practice committee of manufacturers in cooperation with the Bureau of Standards.

The survey disclosed that a great deal of diversification existed in the industry as regards the size of yarns from which this material is made; also a lack of uniformity in the number of feet per pound of

the twine made from these yarns. The survey also disclosed that there existed a wide and unnecessary range of put-ups; that is, weights of twine in balls, tubes, skeins, cut lengths, and reels. Packaging practice was also found to vary considerably. The simplification program as adopted by the industry provides uniform numbers for twines ranging from No. 9 to No. 60, inclusive, for fine twine; and from No. 4½ to No. 8, inclusive, for coarse twine. Two sizes of yarn, No. 8 and No. 2, are specified for use in manufacturing all numbers of twines. Heretofore, the practice has been to use several different yarn sizes for this purpose. The schedule also provides uniform put-ups as regards the weight of twine in balls, tubes, reels, and skeins. Uniform packaging practice for all put-ups is achieved by specifying the number in primary and shipping containers.

Polished cotton twine is the name given to cotton twine which has received special treatment to give it a polish or finish. It is used for wrapping where finish and appearance are desirable, and a large volume is used by department and specialty stores. It is produced in natural white and surface dyed. The colors specified are light tan, dark brown, gray, and green. Colored twine is used by stores desiring to carry out a color scheme in their wrapping and packing practice. Shades of the four colors recommended will meet the normal requirements of those who use this material.

In the opinion of those concerned with the development of this program, its adoption and use will assist in simplifying manufacturing and distribution problems and result in better service to the user as well as a more uniform material. It is felt that the adoption of the program is a forward step in the industry, and those who adhere to it will be placed in a better position to compete with materials used for the same purpose.

### AMERICAN FOREST-PRODUCTS INDUSTRIES

Standardization of forest products is needed as an aid to better marketing of these products, according to Wilson Compton, secretary and manager of the National Lumber Manufacturers Association. The matter of an orderly development of timber and wood conversion industries has been under consideration by the lumber industry for several years, and the 1932 convention of the association gave approval to the establishment of the American Forest Products Industries to carry out this program. The scope of function of this new group will be to encourage simplification and standardization, research, orderly industry planning and responsible public representation of the forest products industries.

In presenting the proposal to the annual meeting of the lumbermen, Mr. Compton pointed out that such an organization would have as its fundamental membership the timber ownerships and the lumber industry. It should, however, he said, include millwork, wood box, flooring, veneer and plywood, wood insulation, small dimensions, poles and piling, and cooperage; and eventually such industries as wood pulp, naval stores, and the products of wood chemistry and wood cellulose.

## TIDE TABLES

On Christmas eve, 1933, the low tide in New York Harbor, at the Battery, will occur at exactly 8:54 p. m. eastern standard time, according to the Tide Tables, Atlantic Coast of North America, published by the United Coast and Geodetic Survey. The publication contains full tide predictions from Greenland to the Canal Zone for 27 ports and gives differences and constants for more than 1,300 stations.

The prediction of tides is one of the important activities of the Coast and Geodetic Survey. By the aid of a machine, it is possible to predict automatically the stage of the tide at any place on the coasts of the seven seas at any designated time for years in advance. Tide tables for 1934 are now being compiled. (The complete official story on this tide predicting machinery appeared in the November, 1931, issue of COMMERCIAL STANDARDS MONTHLY.)

The exact information on tides is much more vital to trade and industry than may be apparent at first glance. Without definite advance knowledge of tide actions, shipmasters would be continually endangering their vessels; docks and alongshore structures could not be planned efficiently; engineers planning sea walls, jetties, and bridges would be working blindly. Those in charge of dredging entrance channels to harbors must know the rise and fall of the tide to determine how deep the channels must be dredged, so that vessels may be accommodated at the lowest tide. Likewise information on the tides is of paramount interest to sportsmen and vacationists who plan outings along the shores of tidal waters. Tide Tables, Atlantic Coast of North America, also give the time of sunrise and sunset, moonrise and moonset.

## SAFETY FOR THE HOUSEHOLD

Bureau of Standards Issues a Publication on Causes and Prevention of Household Accidents

Accidents in the home, which take a toll of about 30,000 of the total of 100,000 accidental deaths annually in the United States, have been analyzed by the Bureau of Standards and found to be largely preventable, according to a new pamphlet just issued by the bureau, entitled "Safety for the Household." The pamphlet presents detailed suggestions for preventing home accidents, such as elimination of specified conditions which cause falls on stairways, a fruitful source of accidents and deaths; provision of guards to prevent injury by household mechanical devices, such as washers, wringers, fans, and lawn mowers; proper disposal of broken glass and trash; and care to avoid placing of articles where they will cause stumbling or where they may fall on persons.

Hazards may be due to physical conditions, to careless habits, or to a combination of both. The former should be dealt with when building the house; the latter are largely a question of housekeeping and hence receive the most attention in this pamphlet, which may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 15 cents a copy. Hazards are classified as mechanical (falls, machinery, cuts, etc.), fire, gas (fire, asphyxiation), electrical (shock, fire), lightning (shock, fire), and miscellaneous (poisons, etc.).

Proper attention to railings, floor coverings, keeping steps clear, lighting, and avoiding substitute for step-ladders will avoid many falls. Power-operated machines require guards. Fires are started by defective chimneys, combustible roofs, defective heating apparatus, matches, careless smoking, gasoline, rubbish, Christmas decorations, electrical defects, lightning, etc. Attention is given to fire-retardant treatment of materials and what to do in case of fire.

Gas leaks, proper choice and installation of appliances, and adjustment, operation and care of appliances are fully discussed. Flexible tubing is a hazard. Carbon monoxide poisoning occurs from running automobile motors in closed garages. Electrical fuses must be kept intact, standard cords and approved appliances used, and grounding carried out if fires and shocks are to be avoided. Handling of appliances in wet places should be avoided. Do not touch live parts. Do not touch plumbing, etc., while handling appliances. Proper protection from lightning is stated.

Poisons should be labeled and kept out of reach of children. Exercise care in use of alcohol, varnishes, polishing, and cleansing materials, disinfectants, fumigants, insecticides, and drugs. Methods of first aid are given, including resuscitation, treatment of burns, scalds, and bruises. Suggestions for building a home cover items involving construction and equipment.

## BRITISH STANDARD VOLTAGES

The British Standards Institution has issued a revision of its specification dealing with voltages for new systems and installations. As regards low voltage, no alteration to the existing standards has been made, but the number of standard high voltages has been somewhat reduced, and special provision has been made for the requirements of the high-voltage interconnected networks of the Central Electricity Board.

A special recommendation has been made with regard to the voltage to be adopted for rural electrification schemes.

## STANDARD FOR BLACK BOLTS AND NUTS

In 1924 the British standard specification for nuts, boltheads, and spanners, was withdrawn in consequence of the publication of specifications dealing with bright bolts and nuts, and spanners.

The demand for a British standard for black bolts and nuts, subsequent to the withdrawal of the specification in 1924, led the British Standards Institution to issue, separately, the table of dimensions for black bolts and nuts. It has been felt, however, that, for an engineering commodity of such general use as black bolts and nuts, a definite specification was necessary, and this need has been met by the publication, by the institution, of a specification for black bolts and nuts, studs, lock nuts, and washers. The specification provides for bolts of diameters from one-fourth inch up to 6 inches and gives the dimensions for the heads, lock nuts, and washers, and the length of the screwed portion. Tolerances on the width across flats and on the thickness of the heads and nuts are also given.

## S. A. E. ASSISTING ARMY WITH MOTOR-TRANSPORT PROBLEMS

At the time of the transportation meeting of the Society of Automotive Engineers, held October, 1931, a general conference was held at the office of the Quartermaster General of the Army and plans of the Quartermaster Corps for the standardized motorization of Army transport equipment were explained and cooperation of industry in the plans discussed. At the meeting of the society's committee on January 28, 1932, plans were perfected for cooperation whereby several groups were appointed to study the units coming within their classification, as planned for by the Quartermaster Corps.

Although economic conditions have made appreciable progress by some of the groups very difficult, considerable has been done by some of them. A meeting of the committee was held June 15, 1932, to review what each group had accomplished and determine what remains to be done to complete the society's part in the Quartermaster Corps program. It was reported that all groups had made some progress but that in some cases not much could be done until the groups representing the several constructional units had brought their reports together for consideration as a whole.

It was decided that each group would complete its study for submission to the members of the general advisory committee of the S. A. E. in time for them to prepare recommendations at the next meeting of the committee during the society's transportation

## IDENTIFICATION OF SIMPLIFIED LINES IN TRADE LITERATURE

For more than a year, correspondence received by the division of simplified practice of the Bureau of Standards has reflected consumer demand for labels or other marks identifying such products as conform to simplified practice recommendations, nationally recognized specifications, standards, etc. Organized consumers have requested the division of simplified practice to point out to producers and distributors the value of identifying simplified lines in trade literature, such as catalogues, lists, and handbooks. They have pointed out that such an identification will greatly facilitate the selection and purchase of the simplified items established through the cooperative action of the industry concerned. The organized consumers requesting this identification include: American Electric Railway Association; American Gas Association; American Home Economics Association; American Institute of Architects; American Railway Association, Division VI, Purchases and Stores; Associated General Contractors of America; National Association of Purchasing Agents; National Electric Light Association; National Retail Dry Goods Association; and the National Wholesale Druggists' Association.

Several hundred manufacturers have already adopted this procedure and it is expected that hundreds more will follow, after they become properly acquainted with the plan. The majority of those approached on the subject have concurred heartily with the suggestion and have taken immediate steps to iden-

tify adequately the simplified lines they manufacture or distribute.

The various methods employed include the use of boldface type, stars or asterisks in conjunction with appropriate notations, and brief descriptions of the simplified lines, in the forewords of the respective types of publications.

The following identifying notation has met with general approval:

The \_\_\_\_\_ listed conform to the industry's Simplified Practice Recommendation No. \_\_\_, \_\_\_\_\_, as issued by the U. S. Department of Commerce. Experience has proven these \_\_\_\_\_ to be the most practical for average purposes, and we recommend their use.

Progressive manufacturers, alert to the trend of consumer demand, recognize that such identification offers a most excellent opportunity for focusing the buyers' attention on the items covered by simplified practice recommendations. This plan is a direct means of eliminating further waste in industry and another step toward stabilization of the production cycle.

## INTERNATIONAL CARBON-CARBURANT CONGRESS

The second International Carbon-Carburant Congress will hold its sessions in Milan, Italy, October 1 to 7, 1932. According to advance announcement received regarding the meeting, the congress has for its purpose the study and discussion of all questions of a scientific, technical, economic, industrial, and commercial nature, with regard to the production and utilization of carbon in so far as it is capable of being used as a subsidiary fuel.

The principal sections of the program as at present outlined are:

1. Scientific, technical, and economy study of carbon carburant.
2. Industrial production of carbon carburant.
3. Utilization and distribution of carbon carburant.

All inquiries regarding the action of this congress should be addressed to the General Secretary, Italian Touring Club, Corso Italia 10, Milan.

## PUBLICATIONS OF INTEREST TO THE CONSTRUCTION INDUSTRY

A mimeographed circular containing a classified list of publications relating to building materials, building codes, home building, home ownership, city planning, zoning, etc., has been prepared by the Bureau of Standards, and is designated as Letter Circular No. 290 (revised). Copies of the letter circular may be had upon request to the Bureau of Standards, Washington, D. C.

The publications listed in the circular cover such topics as brick, building standards, concrete, electricity, fire tests, floors, heating, insulation, metals, paint materials, plaster, plumbing, public utilities, roofing materials, soil corrosion, soundproofing, specifications, tile, wall board, waterproofing, and a number of other items that should be of interest to owners, architects, builders, craftsmen, realtors, and public officials.

## GENERAL CONFERENCE ON SULPHONATED OILS

A general conference of those interested in the production, distribution, and use of sulphonated oils met in New York on June 30 and there adopted a proposed commercial standard for this product. The standard will include definition, nomenclature, and strength, together with standard methods of analysis for the saponifiable types of sulphonated (sulphated) oils.

The conference, after some adjustments, recommended that the standard be circulated to the industry for general acceptance.

Copies of this recommended commercial standard will be available for distribution by the Division of Trade Standards, Bureau of Standards, Washington, D. C.

## SIMPLIFYING WRAPPING PROCEDURE IN STORES

The first major step in a program for the improvement of department and specialty store wrapping and packing practice has been completed by the addition of four simplified-practice recommendations to the elimination of waste series of the Bureau of Standards. These new publications are: Set-up boxes, R126-31; folding boxes, R127-31; corrugated boxes, R128-31; and notion and millinery paper bags, R129-31. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.

In 1930 the National Retail Dry Goods Association requested the Bureau of Standards to conduct a survey of wrapping and packing methods and supplies used by typical member stores. The bureau's original survey showed that 34 stores were using 1,084 sizes of set-up boxes. The simplified practice recommendation reduces this variety to 194 sizes, eliminating 82 per cent. Similarly the variety of folding boxes was reduced from 262 to 59 sizes, or 77 per cent; corrugated boxes from 322 to 75 varieties, or 77 per cent; and notion and millinery paper bags from 188 to 28 varieties, or 85 per cent.

The 34 department stores, representing an aggregate sales volume of nearly \$600,000,000 a year, were selected so as to give a wide range of local conditions. In addition to specialty dry goods stores and large and small department stores, there was included one large organization doing an extensive mail order business. The survey covered methods and supplies used for both ordinary and gift wrapping. The actual field work was conducted during fall, winter, spring, and summer months, so that it was possible to observe the effect on packing practice caused by seasonal variation in merchandise. Geographical distribution was also a factor in so far as it disclosed buying habits and customer requirements.

In February, 1931, a general conference of representative manufacturers and users of wrapping and packing supplies drafted the four simplified practice recommendations. These have now received such volume of support, through the medium of signed acceptances by trade associations and individual firms, as to warrant their promulgation by the Bureau of Standards.

## OIL-STORAGE TANKS

A general conference of interested manufacturers, distributors, and users of oil-storage tanks was held in New York, N. Y., June 16, and considered the proposed commercial standard for oil-storage tanks.

It was voted to refer the standard as adjusted to the committee on flammable liquids of the National Fire Protection Association for further consideration, particularly to refine certain details, with the understanding that that committee will be temporarily expanded to include tank manufacturers, the American Bureau of Welding, and others as their interest may be apparent.

## WAXED TISSUE PAPER

In order to eliminate from the list of stock items many varieties of raw stock used for waxed tissue paper, as well as many sizes of sheets and lengths of household rolls, a general conference of all interests (manufacturers, distributors, and representative users) on May 20, 1931, approved a simplified schedule for this commodity, which was then promulgated under the auspices of the Bureau of Standards.

Waxed paper covered by this recommendation is made by passing full-bleached all-sulphite or other wood-fiber paper through a bath of paraffin wax in order to fill the pores of the paper to make it resistant to moisture and to odors. When used as a sealed wrapper it also protects food products from dust and vermin. Probably the greatest uses are for promoting sanitary handling and shipping of foods, to prevent contact with germ-bearing agencies, and to preserve freshness during long-distance transportation. The familiar bread wrapper is a typical example. It has been estimated that its use has resulted in large savings by reducing the return of stale bread. Waxed paper is also used for the protection of other perishable foods, such as biscuits, cakes, sandwiches, cereals, candy, meats, potato chips, sugar, salt, flour, jello powders, cheese, butter, raisins, dates, berries, vegetables, etc. The estimated total value of the annual production of waxed paper is \$25,000,000. The volume exceeds 250,000,000 pounds per annum.

Of special interest is the recommended elimination of the 400-sheet ream which has been in use in certain sections of the country. Those members of the industry who sponsor the recommendation believe that the elimination of inferior quality paper and wax will insure a better product to the consumer. Concentration on the reduced number of sizes should be of assistance to the manufacturer in improving his products and rendering better service to the distributors and users.

For the safeguard of the consumer the recommendation provides for labeling the consumer packages and shipping containers, and the conferees expressed a preference for a uniform label to be used for this purpose rather than individual designs. This label guarantees that the manufacturer is delivering the recommended qualities, sizes, and counts. This acts to prevent misrepresentation and confusion, and provides a uniform trade basis as well. Copies of the printed recommendation (R. 125-31) may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C.

## GAS GROUP ADOPTS TRADE-PRACTICE RULES

Adoption of standards of practice by three divisions of the Manufacturers' Section of the American Gas Association has been consummated. This action is considered a definite step in the direction of adjusting relations among manufacturers of gas appliances, and adjusting relations among these manufacturers and their customers. The standards apply to all sales, whether direct to consumers, to gas utility companies, or to gas appliance dealers.

These standards of practice were unanimously approved by the manufacturers' section of the American Gas Association at its annual meeting held in Detroit, Mich., September 18, 1931. Printed copies of these standards have been distributed to members of the range, water heater, and space heater divisions, have been signed by executives representing these companies, and have been deposited with the American Gas Association to take effect immediately. These standards, which follow in form those usually promulgated by the Federal Trade Commission, were voluntarily promulgated by the association without resort to the commission. They are far-reaching in their effect on consignment, premiums, returned goods, and other factors entering into the distribution of these appliances from manufacturers to all their customers, whether consumers or gas companies or trade dealers.

Included in the number of rules are two relating to quality-identification marking. These two rules follow:

The false marking or branding of products of the industry, with the effect of misleading or deceiving purchasers with respect to the rating, quality, grade, or substance of the goods purchased, is an unfair trade practice.

The making or causing or permitting to be made or published any false, untrue, or deceptive statement by way of advertisement or otherwise concerning the grade, quality, rating, substance, character, nature, origin, size, weight, capacity, design, material, condition, performance, or preparation of any product of the industry, having the tendency and capacity to mislead or deceive purchasers or prospective purchasers, is an unfair trade practice.

### BLACKBOARD SLATE

A survey of existing practices in the blackboard slate business several years ago brought forth the information that, conservatively, fixed wall blackboards were obtainable in 90 different slab heights; that portable or small blackboards could be purchased in the market in 141 sizes; and that school, score, and memorandum slates were produced in 20 size variations.

It was clearly desirable that a limit be set for standard sizes and that the number of such sizes be reduced to the lowest limit consistent with current normal requirements. Furthermore, reasonable tolerances were needed to prevent the undue waste in quarried slate slabs incident to working to exact specifications, and to insure prompt deliveries by making it unnecessary to await actual completion of finished wall spaces before taking measurements for blackboards. The establishment of such standards would make it possi-

ble to avoid slack seasons, by allowing manufacturers to produce finished blackboards to supply a dependable future demand.

Working under the auspices of the Bureau of Standards, the industry adopted a simplified practice recommendation which reduced the number of slab heights for fixed wall blackboards, from 90 to 3; the number of sizes of portable or small blackboards, from 141 to 14; and in the number of sizes of schools, score, and memorandum slates, from 20 to 8. This recommendation became effective July 1, 1924, subject to annual review. In accordance with this procedure, the standing committee of the industry has notified the Bureau of Standards that the recommendation has been reaffirmed, without change, for another year.

### RAILWAY SIGNALING APPARATUS

The first of a series of specifications relating to railway signaling apparatus, has been issued by the British Standards Institution. This specification deals with terminals employed on electrical signaling apparatus. It has been found possible to restrict the number of sizes of terminals to two, thereby greatly simplifying the work of the linesman in making adjustments on the site. A special design of terminal has been standardized with a view to facilitating the attachment and removal of wires from terminals in awkward positions. The dimensions and the standard assembly of the various component parts are also specified.

### STRUCTURAL STEEL IN BUILDINGS

The British Standards Institution has issued a standard specification for the use of structural steel in buildings, which is based on the work carried out by the steel structures research committee of the Department of Scientific and Industrial Research and the British Steelwork Association, on behalf of the steel and structural engineering industries of Great Britain. The results are now made available in the form of the new specification, the use of which will permit increased efficiency in building construction.

The London County council has already taken advantage of the research and the recommendations contained in the steel structures research committee's first report, and has adopted a code of steelwork practice for guidance in the application of the third schedule of the London building act of 1930. While the code has no status as a repealing enactment, it defines the limits within which the authorities are prepared to consider applications for relaxation of the regulations. It was felt that the code was worthy of a wider application in the national interest and that it should be rendered in a form suitable for use by all local authorities throughout the country. Accordingly, a committee of the British Standards Institution was formed to review the recommendations and to issue a British standard specification.

Approval of the specification has been given by the Ministry of Health, and His Majesty's Office of Works has indicated its intention of using it. In professional circles it has received unqualified support and approval in view of the up-to-date provisions which make for greater economy in building construction.

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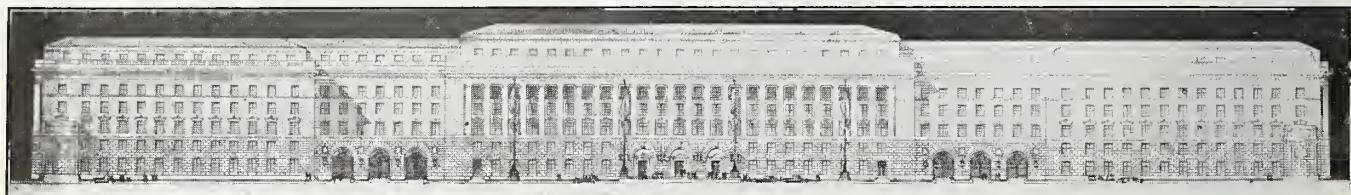
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Survey of the coasts of the United States and publication of charts for the navigation of the adjacent waters, including Alaska, the Philippine Islands, Hawaii, Porto Rico, the Virgin Islands, and the Canal Zone; interior control surveys; magnetic surveys; tide and current observations; and seismological investigations. Publication of results through charts, coast pilots, tide tables, current tables, and special publications.

## BUREAU OF NAVIGATION, ARTHUR J. TYRER, Commissioner.

Superintendence of commercial marine and merchant seamen. Supervision of registering, enrolling, licensing, numbering, etc., of vessels under the United States flag, and the annual publication of a list of such vessels.

Enforcement of the navigation and steamboat inspection laws, including imposition of fees, fines, tonnage taxes, etc.

## STEAMBOAT INSPECTION SERVICE, DICKERSON N. HOOVER, Supervising Inspector General.

The inspection of merchant vessels, including boilers, hulls, and life-saving equipment, licensing of officers of vessels, certification of able seamen and lifeboat men, and the investigation of violations of steamboat inspection laws.

## UNITED STATES PATENT OFFICE, THOMAS E. ROBERTSON, Commissioner.

The granting of patents and the registration of trade-marks, prints, and labels after technical examination and judicial proceedings.

Maintenance of library with public search room, containing copies of foreign and United States patents, and trade-marks. Recording bills of sale, assignments, etc., relating to patents and trade-marks. Furnishing copies of records pertaining to patents. Publication of the weekly Official Gazette, showing the patents and trade-marks issued.